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Paper Ranked High As Essential Industry By Association Officials

Paper in many forms has become a necessity. The essential character of paper and paper products is well reflected in the steadily increasing consumption in the United States which is estimated at approximately 300 pounds per capita for 1941. Paper has gone to war in many essential forms, substituting satisfactorily for many critical metals and saving substantial costs in packaging military supplies in great variety. In this symposium officials of the leading trade associations in the industry, representing an important cross section of the men and concerns throughout the country who make and sell paper, contribute interesting comments on the subject which serve to visualize in an impressive manner the indispensable place occupied by the paper industry in the economy of the nation.

American Paper and Pulp Association

GEO. H. MEAD, PRESIDENT

As incredible as it may seem, America's paper industry is even now regarded by some persons as not essential to war! This is obviously due to a lack of understanding.

It is not my intention to demonstrate why this industry is essential, nor to search out the latest statistics that would prove it to be so. I have enough faith in human nature to believe that the obvious must somehow become apparent.

Who for example, could fail to realize that it takes paper to design an implement of war, be it bomb or battle-ship; to construct the machinery to make that implement; to order raw materials; to speed and to control production; and to pay the workmen and the bills?

A creative writer could very quickly dispel all misguided notions regarding the vital role being played today, and in the days of peace, by our industry.

He would ask his readers, perhaps, to imagine the successful prosecution of the war if paper were nonexistent. And in a few deft paragraphs, he would convince them that, without paper, production would stop . . . transportation would be paralyzed . . . communication and information would dissolve . . . the war would be lost.

The paper industry appears to the lay mind as the supplier of the product which makes possible the writing of letters; the printing of books, magazines, and newspapers; the wrapping of packages; the packaging of products . . . of the product which becomes paper napkins and towels and doilies and wallpaper and telephone directories and toilet paper.

What an added wealth of material our creative writer could draw upon! Paper raincoats . . . paper sheets and pillow cases . . . laminated plastics, 70% of which are made with paper . . . paper thermometers . . . paper containers, impervious to oil, milk, and other liquids . . . papers made from clay, called Bentonite . . . paper to replace mica for insulation . . . the by-products of paper which make vanilla flavoring, which tan leather, which filter sugar and beer, which yield yeast, which are used in the manufacture of soap, ink, textiles . . .

The paper industry is not essential?

In my opinion, the concern of the paper industry is not to prove to the uninformed that the industry is essential, but to prove to itself that, as an essential industry, it is fully capable of mobilizing its resources and its manpower to discharge loyally and honestly its war-time responsibilities to the Government.

Technical Association of the Pulp and Paper Industry

R. A. HAYWARD, PRESIDENT

Since preparing the booklet "Paper—The Lifeblood of Civilization," the war has progressed and we have lost our supply of tin which came principally from the Malay Peninsula, our principal supply of chromium, and our rubber supply. Paper products are now being developed to replace these materials which have become scarce and critical.

New resins and new adhesives have been developed and applied to paper which through the combination have developed properties which permit materials to be packaged in paper products which formerly was considered impossible.

The producers of various food products are cooperating with the technical men of the paper industry and miracles are being performed. There is every reason to expect that our food supply will be merchandise in just as well protected a form through paper products as it was formerly handled in tin cans.

(Continued on page 78)

Special Chlorination Unit Based on the Celdecor-Pomilio Process for Bleached Straw Pulp

In view of the difficulty of obtaining supplies of raw materials for the manufacture of paper and boards, the information presented herewith regarding the process and plant for the production of bleached straw pulp, papers and straw semi-pulp for boards of the Cellulose Development Corporation, Ltd., 9, Anselm road, Hatch End, Middlesex, England, is of more than usual interest and importance.

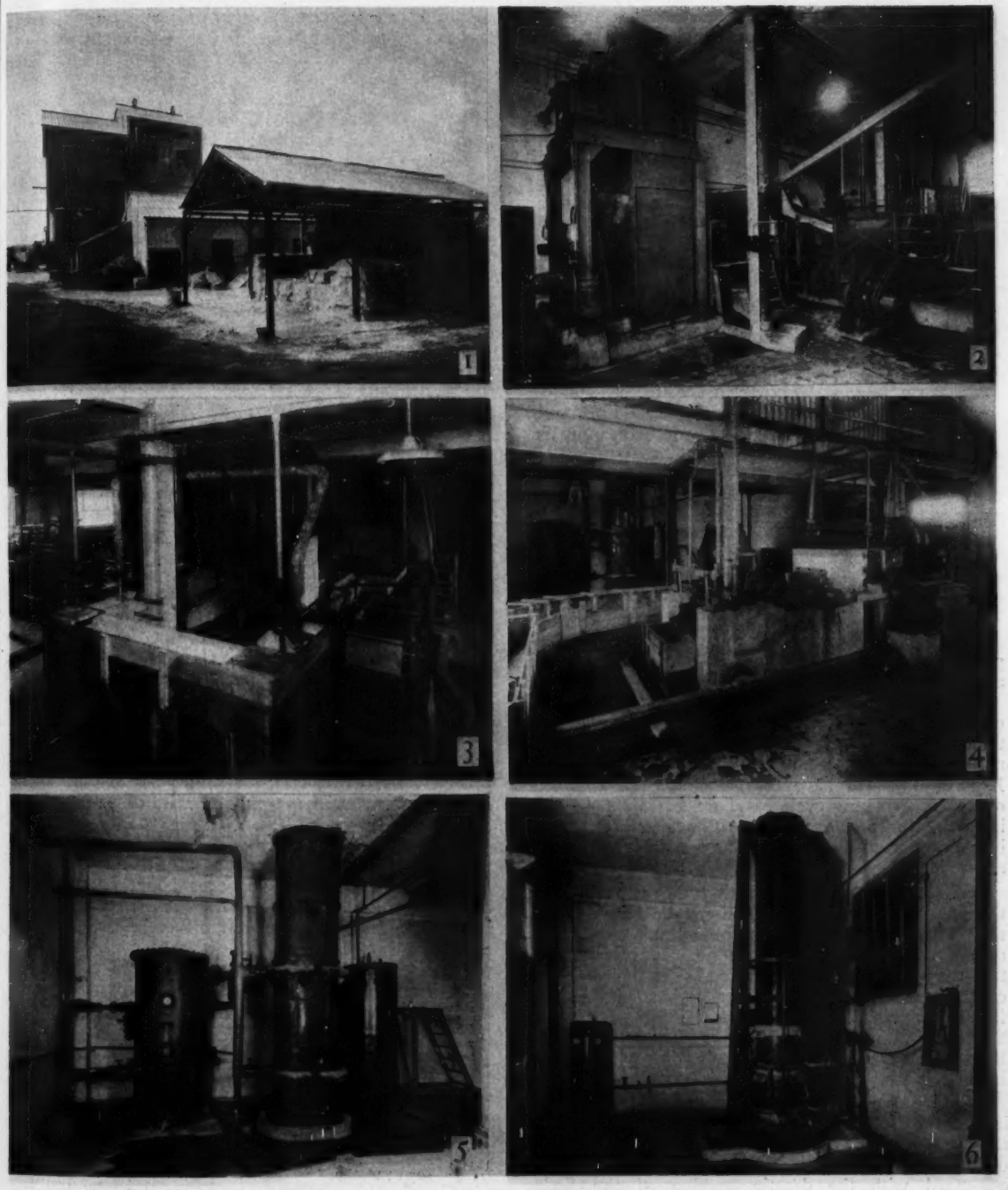
Acquires Patent Rights for Pomilio Process

This corporation was formed in 1938 as a subsidary of the Union Corporation Ltd. of London and acquired the patent rights in all the more important countries of the world for the Pomilio Gas Chlorination Process. Since then a large-scale mill has been installed in South Africa, which is now manufacturing paper from wheat straw and local woods. Another pulp and paper mill started production last May in the Philippines. This mill was converting bagasse into bleached pulp and paper.

In Great Britain the corporation now has a semi-industrial demonstration plant in continuous operation which is producing approximately one ton per day of bleached pulp from cereal straws. Attached to this plant the corporation has its own research laboratories where fundamental research is carried out in connection with the conversion of vegetable raw materials into pulps suitable for paper and board manufacture by its own and other processes. In order to assist in the war effort the company has developed a chlorination unit which, in effect, is a part of the full Pomilio process which can be readily adapted to Esparto grass mills which are equipped with stationary digesters now being used for the boiling of straw by the soda process.

RESEARCH LABORATORIES OF CELLULOSE DEVELOPMENT CORP., LTD.

FIG. 1—General View of Industrial Laboratory Showing Miniature Beater, Disintegrator, Screener and Kollergang. FIG. 2—General View of Industrial Laboratory Showing Air Compressor, Stationary and Rotary Digesters, Chlorination Equipment, Drying Oven, Etc. FIG. 3—General View of Chemical Laboratory. FIG. 4—General View of Pulp Evaluation Room. Double Doors on Left Lead to Constant Humidity Room.



PILOT PLANT OF CELLULOSE DEVELOPMENT CORPORATION, LTD.

FIG. 1—General View of Plant. (Note Bricked-in Windows on Account of "Blitz" Damage). FIG. 2—General View of Ground Floor Showing Extractor Mechanism at Bottom of Digestion Tower, Drum Thickener, Screw Press, Etc. FIG. 3—General View of First Floor Showing Continuous Digestion and Chlorination Towers (Left and Right Background), Screening and Thickening Plant and Vacuum Pump, Etc. (Extreme Left). FIG. 4—General View of Second Floor Showing Continuous Digestion Tower (Left Background), Continuous Chlorination Tower (Right Background), Rotor Vacuum Filter, Shaking Screen. FIG. 5—View Showing Part of Continuous Digestion Tower with Steam Inlet Pipes. FIG. 6—View of Part of Continuous Chlorination Tower Showing Chlorine Gas Inlet Pipes. (Note Lower Portion is Made of Glass for Demonstration Purposes. Upper Portion is Made of Keebush—a Plastic—to Replace Glass Lost in "Blitz").

Process for Bleached Straw Pulp

The engineering department of the Cellulose Development Corporation, Ltd. describes the special chlorination unit for the production of bleached straw pulp as follows:—

"When War broke out it was realized that the utmost economy would have to be exercised in the construction of new plants. We therefore set about the design of a chlorination unit which could be used in conjunction with existing esparto grass digestion plants.

"This chlorination unit consists in the main of a receiving chest into which the contents of the existing

grass boilers are discharged. The straw is cooked for 2 hours at atmospheric pressure and is cut out by the usual high pressure jet arrangement. The semi-cooked pulp is then pumped at about 4% to a head box at the top of the building and is allowed to flow through Thickeners which reduce it to about 8% at which consistency it is suitable for charging the continuous screw presses. The cake of compressed pulp is then broken up in screw conveyor and dropped into an opening cone which flocculates the material and drops it to the floor below ready for feeding into the chlorination towers.

"The chlorination towers are built of "Keebush" which is a phenol resin plastic. The material takes about 2 hours to travel through these towers and a mixture of chlorine gas and air is admitted through nozzles into the semi-pulp. There are glass inspection windows at various levels in the tower so that the reaction can be visually controlled. After chlorination the material is extracted by a special mechanism and dropped into an acid pulp chest where the pulp receives a cold water wash. The pulp then flows through Thickeners before being dropped into an alkaline pulp chest. This chest is so called because at this stage caustic soda is added to extract the chloroliginnes formed during the process of chlorination.

"The pulp is then pumped to a suitable black liquor extracting plant such as a vacuum filter and the now unbleached pulp is ready for rough and fine screening.

"As all the Esparto grass mills are already equipped with bleaching plant there is no necessity to make any alterations to this part of the plant.

"The main feature of the Chlorination Unit concerns the much increased output which can be obtained from the existing digesters. At present the majority of mills which are boiling straw in their Esparto digesters have to reckon with a complete operational cooking cycle of about 12-15 hours. The installation of a chlorination unit enables this cycle to be reduced to 6-8 hours. Production is consequently approximately doubled.

"Offhand it might appear that the remainder of the pulp and paper mill would not be able to cope with this much increased output. It should be remembered however that the majority of Mills find that they are only able to work to half their former capacity when using Straw in the place of Esparto. In other words a chlorination unit permits an Esparto mill to produce the same quantity of bleached Straw Pulp and paper as it previously did when using Esparto grass.

"On the economic side there are considerable savings in the consumption of chemicals and steam. On the question of quality the resultant pulp is stronger owing to the much milder treatment it has received as compared with the drastic cooking of the Soda process. The yield is also substantially higher.

"After the War these chlorination units could still be used for esparto with equal advantage over the older process and if necessary could form the nucleui of full "Celdecor-Pomilio" process pulping plants."

Straw Semi-Pulp Unit

The engineering department of the Cellulose Development Corporation, Ltd. describes the straw semi-pulp unit for the production of pulp for board manufacture as follows:—

"The straw semi-pulp unit corresponds in the main with the first stage of digestion of the full "Celdecor-Pomilio" process and is of high capacity and is based on continuous production. First of all the straw is cut and blown to a cyclone at the top of a building. The straw then drops into a soaking machine which ensures that the cut straw is thoroughly soaked in a dilute solution of caustic soda. The quantity of caustic soda taken up amounts to about 6-7% of the weight of the straw.

"The soaking machine continuously delivers the wetted straw to a continuous "Celdecor" Digester and the material takes about 2 hours to travel from the top to the bottom. Steam is admitted through annular pipes at about 10-15 lbs. per square inch. Sight glasses are fitted to the tower at various levels and thermometers are similarly fitted so that the stages of digestion can be controlled at all times.

"At the bottom of the tower the cooked pulp is extracted by means of special mechanism and dropped into a draining screw conveyor. Wash waters are also added to this conveyor so that the pulp ultimately emerges comparatively free of residual caustic.

"If completely caustic free material is required it can follow the lines of the full "Celdecor-Pomilio" process by being thickened and fed to a continuous screw press. This material is then dumped into a storage chest whence it can be pumped to any of the usual form of disintegrators before being sent to the board machines. In cases where completely caustic free pulp is not required then the continuous screw press is omitted and the material is merely washed in large dilution chests and finally on the board machine itself. The standard tower unit has an output of 20-22 tons a.d. semi-pulp per 24 hours. Any number of these units may be installed alongside one another. The semi-pulp produced by this process should not be confused with the ordinary lime cooked straw board pulp. The characteristics of our semi-pulp approach those of unbleached pulp and exhibit high strength characteristics compared with other forms of straw pulps."

Illustrations are presented herewith of the pilot plant and research laboratories at St. Paul's Cray Kent. This little plant produces about one ton of bleached straw pulp per 24 hours and although it is naturally a sub-economic unit, nevertheless, it is in operation day and night in order to contribute towards the war effort. A neighboring mill consumes the pulp where it is added along with their other furnishes for the production of special papers.

Goes With Stebbins Engineering Co.

WATERTOWN, N. Y., November 23, 1942—F. J. Hoar, for the past five years manager of Canadian Stebbins, has returned to the United States to supplement the war effort of Stebbins Engineering and Manufacturing Company as project engineer.

The Stebbins Company, in addition to its lining and tank business in the paper industry, is engaged in a large volume of special lining work for various government agencies. Mr. Hoar will supervise a number of projects pertaining to direct war work.

Mr. Hoar is a native of Fall River, Mass., a mechanical engineering graduate of Clarkson College, and has been with the Stebbins Company for a number of years. He has traveled extensively throughout the United States and Canada, and is experienced in the process industries.

T. M. Kettles will serve as manager of Canadian Stebbins Engineering and Manufacturing Company, Ltd.

Rototrol Provides Operating Advantages in the Pulp and Paper Industry

By W. R. Harris—Paper Mill Engineer, Westinghouse Elec. & Mfg. Co.

During the last few years the pulp and paper industry has been characterized by higher speeds, better and more closely controlled quality of product, and greatly increased production. During this time formation speeds on some grades have reached 1500 to 1800 fpm.; winder speeds have reached 4000 fpm.; supercalender speeds have jumped to as high as 2000 fpm. and the future holds promise of even higher speeds.

A contributing factor to the successful high speed performance of these machines is the modern adjustable voltage type of electric drive, the development of which has kept pace with continually increasing requirements. The addition of an important new electrical regulating device to the adjustable voltage drive has tremendously increased its capabilities and broadened its application. This regulator, known as the Rototrol, used with drives such as those for paper forming machine, auxiliary helpers or wet ends, reels, and supercalenders, assures better reliability and economy of operation, a more uniform product with minimum waste, more uniform rolls, better formation, and longer felt life.

This regulator is essentially a small direct-current machine similar in both construction and theory of operation to the standard d-c generator of like size. The magnetic circuit is excited by a number of field windings. The Rototrol functions entirely through the interaction of these fields, without moving parts requiring delicate adjustment. After the initial adjustments during installation, no further attention other than the routine maintenance associated with a d-c machine of similar size is required. The unit is driven at constant speed and usually forms a part of the main motor-generator set or the exciter set.

The Rototrol, as shown in the functional diagram Fig. 1, is one of the most simple regulators yet devised. The principal elements are:

(1) A control pattern field which serves as a reference against which the quantity to be regulated is compared.

(2) A control pilot field which measures the quantity to be regulated.

(3) A self-energizing field in the output circuit which assures accurate control.

For a high degree of accuracy the pattern and pilot

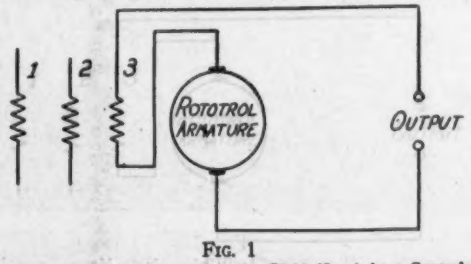


FIG. 1

Functional Diagram of the Rototrol. Field No. 1 is a Control Pattern Field which Serves as a Reference Against which the Quantity to be Regulated is Compared; Field No. 2 is the Control Pilot Field which Measures the Quantity to be Regulated; Field No. 3 is the Self-Energizing Field in the Output Circuit which Assures Accurate Control.

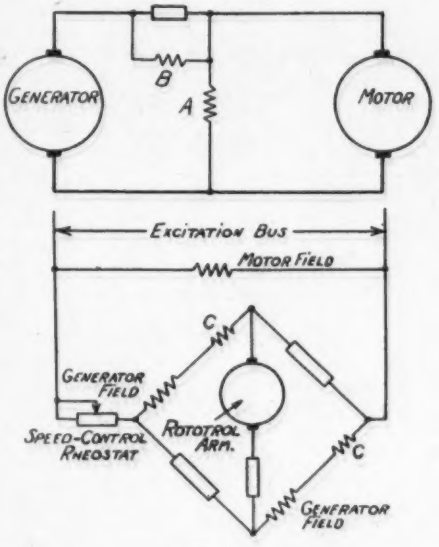


FIG. 2

Adjustable Voltage Supercalender Drive with Rototrol Speed Control. Fields A, B, and C are Rototrol Fields Which are Arranged to Measure and Control the Speed of the Motor Without the Use of a Pilot Generator.

fields must have complete control over the Rototrol without supplying any of the power necessary in the output circuit. The self-energizing field is designed to meet this condition. This results in a very high amplification since only an extremely small change of power in the control fields is ample to change the output over its full range. Actually this regulating device provides such high amplification and sensitivity that it is able to function without the use and complication of supplementary amplifiers—an important advantage where simplicity of circuits and operation are desired and savings in critical materials are desirable.

Low Threading and High Productive Speed Obtained on Supercalender Drive

On supercalenders, productive speeds as high as 1500 to 2000 fpm. are becoming common. For safety and economy these stacks must be threaded at approximately 50 fpm. The adjustable voltage direct current drive, except for its drooping speed-load characteristic, is particularly suitable for this extremely wide speed range. Although this drooping characteristic is not harmful at operating speeds, it is detrimental at threading speed because the generator is operating at practically residual voltage, and a small load change means a relatively large speed variation. Since the load during threading may vary two to one or more, an unregulated drive on a high speed machine is subject to considerable speed variation. This is dangerous to the operators, and since the stack has to be

handled so carefully, threading is slow and operating efficiency is impaired.

Two methods of obtaining stable threading speeds were previously in common use. One method was to obtain part of the speed range by motor field control, which only partially eliminated the difficulty and was expensive due to the large frame size of the driving motor. The scarcity of material at present doubly prohibits the use of this method. The other method made use of a separate motor geared to drive the calender at threading speed through an overrunning clutch. This method gave stable threading speeds but resulted in an undesirable and complicated mechanical layout.

The adjustable voltage system with Rototrol control makes possible a simple and economical supercalender drive and automatically maintains a safe uniform threading speed regardless of load changes. Figure 2 shows schematically the essential circuits. Fields "A" and "B" measure the two factors—armature voltage and load current—which determine the speed of the D.C. motor driving the calender, and field "C" serves as both a pattern and a self-energizing field. The Rototrol armature is connected in a special bridge circuit with the generator field and compensates the generator excitation to maintain essentially constant motor speed for any setting of the speed control rheostat. No pilot generator for indicating motor speed is required. This simplifies the drive and saves valuable space about the calender. Here again, use of the Rototrol results in a saving in critical materials. Preset speeds can be obtained by a slight modification of the control circuits.

A large eastern mill recently installed a high speed supercalender drive with Rototrol threading speed control. The flexibility and simplicity of the drive and its precise control of threading speed resulted in a higher operating efficiency of the stack. As a result, three additional units have been installed to replace older forms of drive, and two more units have been built for other mills of the same company.

Accurate Speed Regulation Provided for Single Motor Paper Machine Drive

Accurate control of the speed of a paper forming machine is highly desirable to assure high operating efficiency and uniform quality of product. A wide range of operating speeds is also necessary so that different weights of a paper can be formed. Furthermore, the most efficient overall performance of the machine is assured when the speeds of the wet end sections are not affected by clutching in or out the heavier sections of the machine such as the dryers or calenders. The adjustable voltage drive is usually applied to the paper machine, and due to the accurate speed regulation required speed regulating means are usually specified. The Rototrol provides a simple, accurate, and rugged form of speed regulating device for this service.

FIG. 3

Rototrol Control Assures Accurate Threading Speed Regardless of Variation in Load on this Supercalender Powered by a 150 hp. Adjustable Voltage Drive.

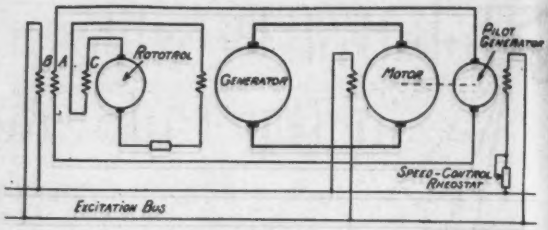


FIG. 4

Schematic Diagram of a Single Motor Paper Forming Machine Drive with Rototrol Speed Control.

The essential circuits of the single motor paper machine drive with Rototrol speed control are shown in Fig. 4. Pilot field "A" measures the pilot generator voltage which is directly proportional to motor speed. In this case, the extreme accuracy demanded of the regulator necessitates use of the pilot generator. Pattern field "B" serves as a reference against which the motor speed is checked. When the motor speed is correct fields "A" and "B" balance out. A very small change in motor speed will disturb this balance and cause this regulating device to compensate the main generator excitation and voltage to bring the motor speed back to the correct value. The self-energizing field "C" maintains the output at any level as determined by the pattern and pilot fields and assures accurate speed control. The operating speed is preset by means of a small manually operated

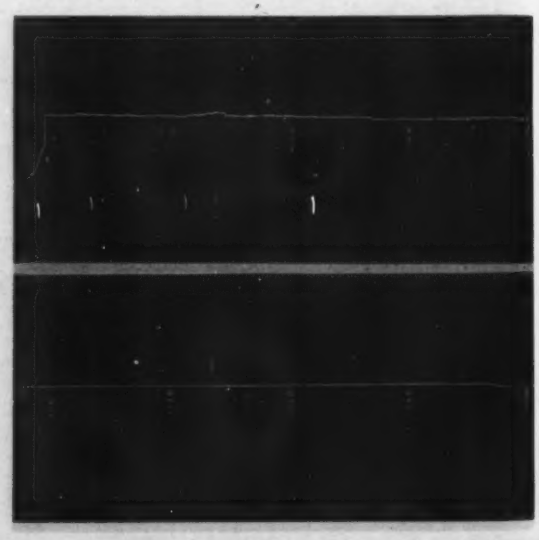
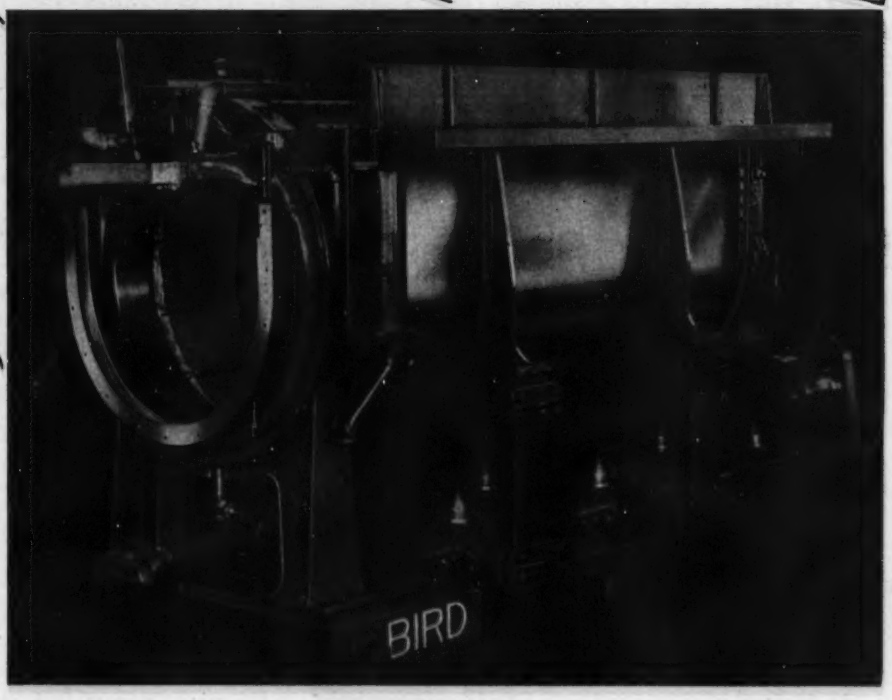


FIG. 5

Graphic Charts Show Performance of a Single Motor Paper Machine Drive Before and After Application of Rototrol Speed Regulator. The Top Chart Shows the Performance Before Installation of the Regulator, and the Bottom Chart Which Is Typical of the Accurate Performance of the Regulator Shows the Performance After Its Installation.

KEEP AN EYE ON YOUR SCREENS



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rheostat provided with a convenient dial and located in the master control cabinet.

Operating results with this simple and accurate regulator are most satisfactory. The "before" and "after" charts of Fig. 5, taken on a 250 hp. single motor paper machine drive, are typical of the accurate performance of this speed regulator. A decided advantage of the Rototrol is its ability to regulate accurately without the use and complication of supplementary amplifiers. This results in simplified circuits, lower maintenance, and saves critical materials.

Rototrol Replaces Slip Belt Drives on Core Type Reel

The core type reel requires an adjustable speed drive to compensate for changes in diameter as the roll builds up. Many of the older machines are equipped with "slip-belt" drives for obtaining the required speed adjustment. Such drives are cumbersome and require excessive power and maintenance due to the "slipping" belt. Furthermore, continual adjustment is required as the paper builds up from an empty to a full roll. Failure to make these adjustments results in poorly wound rolls or in paper breakage and lost production, and due to the human element duplication of results are difficult to obtain.

The adjustable speed motor drive with Rototrol tension control entirely overcomes the shortcomings of the "slip-belt" mechanical drive. The drive consists of an adjustable speed d-c motor connected to the driving shaft of the reel, a source of d-c voltage proportional to paper speed, and suitable control with Rototrol tension regulation.

Figure 6 shows schematically the essential circuits. The Rototrol supplies the field current of the adjustable speed d-c motor. The motor armature current is measured by pilot field "B" and compared to the pattern or reference field "A." Field "C" serves as a self-energizing means and assures accurate control. Since fields "A" and "B" must always balance out the motor armature current is held at a constant value as determined by the setting of the tension rheostat in field "A." For any set productive speed and motor armature voltage, constant current results in constant output of the reel motor. This action results in substantially constant sheet tension as the roll diameter changes from an empty to a full roll. The reel motor operates over the speed range required from empty core to fullroll by adjustment of its excitation under control of the Rototrol.

The operators may adjust the sheet tension by means of the "tension" rheostat, an increase in tension resulting in an increase in motor load. These adjustments may be readily observed on the motor ammeter which permits duplicating adjustments and thus obtaining the most satisfactory roll for any given weight or grade of paper.

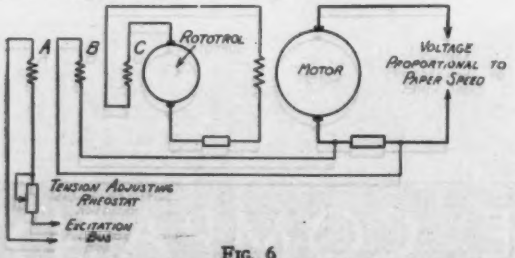


FIG. 6
Schematic Diagram of Adjustable Speed Reel Drive with Rototrol Sheet Tension Control.

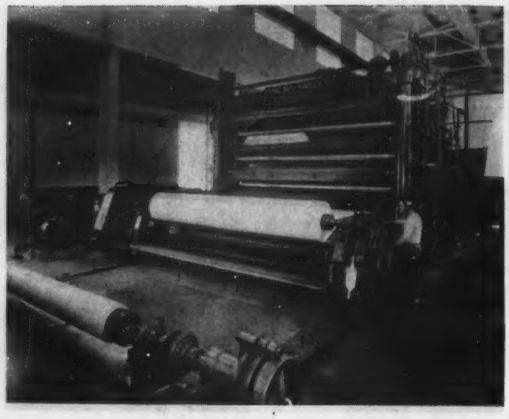


FIG. 7
Center Wind Reel Drive with Rototrol Controlled Adjustable Voltage Drive. The Forced Ventilated Driving Motor is Shown to the Left, and the Centralized Operator's Panel at the Right. The Operator's Panel Contains a Tension Adjusting Rheostat and an Ammeter which Permits Duplicating Adjustments and Obtaining the Most Satisfactory Roll for any Given Weight or Grade of Paper.

The unusual performance of the Rototrol was strikingly illustrated during a recent installation on a "double duty" reel. During transfer of the roll from the peripheral wind position to the "center wind" position, the operator neglected to throw in the clutch which connects the core to the Rototrol controlled adjustable speed motor drive. By the time the operator found the trouble several feet of paper had piled up between the calender and the reel. The clutch was then thrown in. The drive accelerated the reel, picked up the excess paper, and settled down to the correct speed and tension without breaking down the sheet. This performance gives proof of the reliability, sensitivity, and speed of response of the Rototrol system.

Constant Torque at All Operating Speeds Assured for Auxiliary Wet End Drive

During the past few years the operation of auxiliary wet end drives for cylinder type paper machines has fully justified claims of increased felt life, higher quality of product and better economy of operation. These drives consist of a power-supplying generator, direct current motors geared to the various sections, and suitable control expressly selected to meet the operating requirements. The use of the Rototrol with these drives assures constant torque or driving effort regardless of the operating speed of the machine and simplifies the operation of the drive. This driving effort may be changed by a simple rheostatic adjustment, and is automatically maintained over the operating speed range with no further attention from the operator. The drive is properly interlocked so that it starts and stops in synchronism with the main

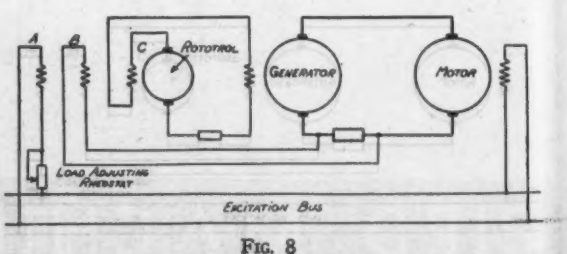
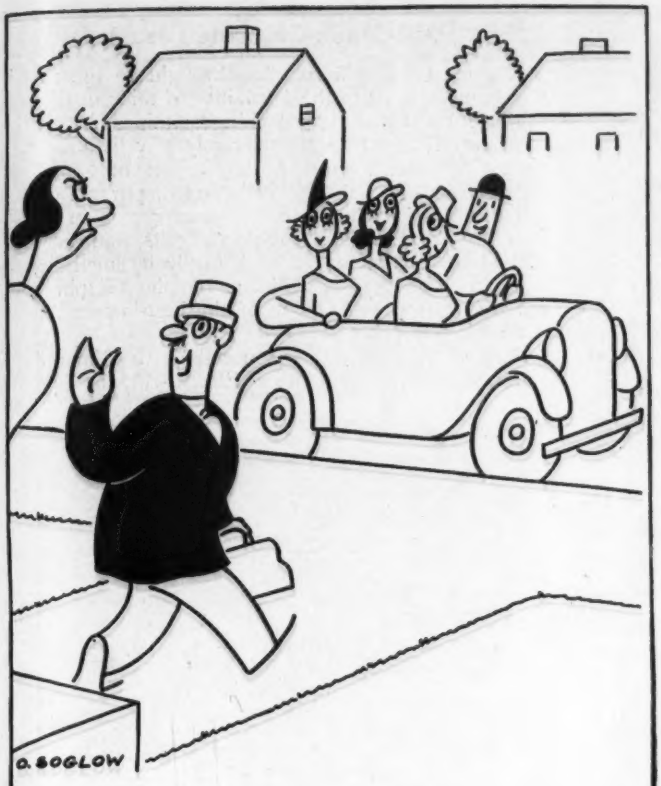


FIG. 8
Schematic Diagram of Auxiliary Helper Drive with Rototrol Regulator for Holding Driving Effort Constant.



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drive. From the operator's viewpoint, the operation of a machine provided with such a drive is no different than the operation of an ordinary machine.

The usual arrangement has been to drive the power-supplying generator from the machine lineshaft. Rototrol control permits use of an alternate method whereby a separate motor-generator set is used. Advantages of this system are two-fold: (1) Less power is required from the lineshafting and main drive of the paper machine, and (2) valuable space about the machine is saved.

The essential circuits of this controlled drive are shown in Fig. 8. The excitation of the power supplying generator is adjusted to maintain constant current in the motor armature circuit. Since the motor is excited at constant potential constant torque or driving effort is supplied to the motorized section. Pattern field "A" and pilot field "B" which measures the armature current must always balance out. Since pattern field "A" is excited at constant potential as set by the load adjusting rheostat, the armature current is held at a constant value. The self-energizing field "C" assures accurate control under all conditions of generator excitation.

This type of drive is particularly suitable for either partial or complete wet end electrifications, suction drum roll drives, top press roll drives, and dual press helper drives.

These numerous applications have proven the Rototrol to be a valuable aid in solving and simplifying problems of electrical drives in the Pulp and Paper Industry. Operating experience has shown: (1) That it is sufficiently elemental in operation to be understood by non-technical maintenance personnel, (2) That its stability and reliability assures continuity of production, and (3) That it combines the necessary degrees of sensitivity and amplification to function accurately without the use of supplementary amplifiers. These characteristics are all prime requisites of regulating equipment suitable for paper mill service. As time goes on this important and proven electrical regulating device will undoubtedly aid in solving many of the problems which will arise in this progressive and growing industry.

Powell River Employs More Women

More and more women are being utilized in various departments of the Powell River Company Limited in its pulp and paper mill at Powell River, B. C. To date the beater room, sulphite plant, finishing and pulp testing departments are all providing employment for a number of women. The management is using up the available reserve of local women workers before accepting applications from outside points, and, in anticipation of such a move, recently completed a thorough survey to determine in what department women could be employed. Necessary rest room and other facilities for women employees have now been installed and a satisfactory solution has been worked out with local trade union groups regarding wages and working conditions.

Many of the women now employed in the Powell River plant are wives of former employees now on active service. In some cases the women are holding down the same jobs which their husbands held prior to the war.

The honor of being the first woman ever employed in the Powell River plant belongs to Miss Mary Cavanaugh, who took over a position as pulp tester.

Mill-Made Chlorine Bleach

A shortage of chlorine has brought to the forefront questions as to the feasibility of mills installing equipment for making bleaching solutions for their own use. Although some electrolytic cells used in producing chlorine or hypochlorite are of two distinct classes—hypochlorite cells and diaphragm cells.

There has been considerable development in Germany of large-scale hypochlorite cells, but in the United States they are available only in small sizes.

Large producers of chlorine employ diaphragm cells of various types. One of the best-known types is the Hooker Cell.

Another type of diaphragm cells is the Emar cell manufactured by the Emar Electra-Bleach Equip-

Apparatus for Making Bleach

ment Division of the Emtree Manufacturing Company, 10 West Mravlag Place, Elizabeth, N. J. This cell is employed in the apparatus for making bleach shown in the accompanying illustration. Originally designed for laundries, this particular apparatus is now beginning to find application in textile mills. The cells are built in various ampere capacities ranging from 6 amperes up. A cell of 48-amp. capacity produces somewhat over 3 lb. of chlorine per day, and a large number of cells can be connected in series in one unit to utilize the 110- or 220-volt d.c. current available in many plants. As the chlorine produced by the cell is immediately absorbed by the caustic soda also produced by the cell, there is no appreciable quantity of chlorine gas in existence at any time. With this type of apparatus, it is possible to produce sodium hypochlorite solution having a strength of 50 g.p.l. available chlorine or greater. To produce 1 lb. of chlorine and approximately 1 lb. of caustic soda, 3½ lb. of salt in form of a saturated solution and 2-kwh. of power are required.

Thilmany Employees Tendered Banquet

Appleton, Wis., November 23, 1942.—Employees of the bag mill of the Thilmany Pulp and Paper Company, Kaukauna, Wis., were tendered a banquet November 19 at Hotel Kaukauna in honor of winning first place in the paper and board re-manufacturing group in the National Safety Council's annual contest. The mill has not had a lost-time accident since June, 1940, making a record of 930 days.

Karl E. Stanbury, president of the company, presented the Safety Council's trophy to John Eimmerman and Beverly Brown, who were selected by employees to make the acceptance.

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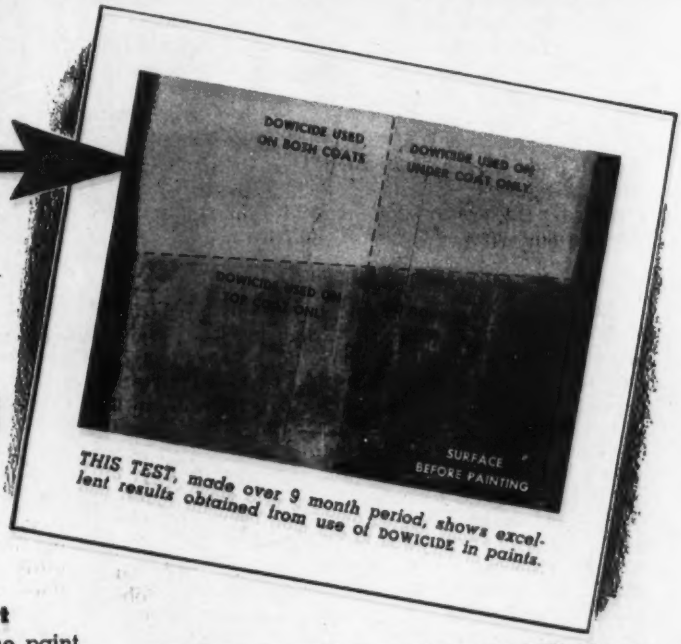

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(1) Controls slime conditions.

(2) Prevents stain and decay on pulp logs.

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(4) Prolongs felt life.

(5) Makes paper products mold-resistant.

(6) Preserves proteins, starches, and other sizing materials.

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Carbon Black in the Paper Industry

By L. H. Cohan, Research Laboratory, Continental Carbon Co.

Black paper, long recognized as a convenient and inexpensive material for screening out light in such applications as wrapping photographic supplies, has recently taken on new importance as a material for use in blackouts, should they become a regular necessity. From the standpoint of pulp conservation also, black paper has become a subject of increased interest. It permits the utilization of news, colored broke, scrap, and waste paper of all kinds as raw materials, without the need for de-inking and bleaching operations.

A further use of black paper may be found in improving the appearance of ordinary grades of wrapping paper. Such paper often contains bits of fiber and other visual imperfections, which are concealed by the black coloring. In addition, packages wrapped in black paper present a novel appearance and remain presentable under more severe handling conditions.

With the use of special carbon blacks such as Continental's Nutone, a semi-conducting paper can be prepared. Such a product is useful in connection with various types of electrical equipment.

Preparation of Black Paper

One of the most economical ways of preparing black paper is by the use of carbon black. Besides being inexpensive, carbon black does not interfere with the size and other paper properties and gives a permanent, non-fading color. For paper blacks, such as Continental uncompressed or Continental P, about 5% by weight of the air dry pulp is sufficient to produce a jet black paper. For manufacturing the various shades of grey, correspondingly less black can be used. As with other pigments, color depends to some extent on the length of time the pulp is left in the beater. However, if the beating time is controlled within reasonable limits, uniform results can be obtained. The type of pulp employed also has an effect on the intensity of color.

FIG. 1

Bird's-Eye View of Modern Carbon Black Plant Composed of 366 Production Buildings Covering an Area of 160 Acres on the Texas Panhandle, near Sunray, Texas

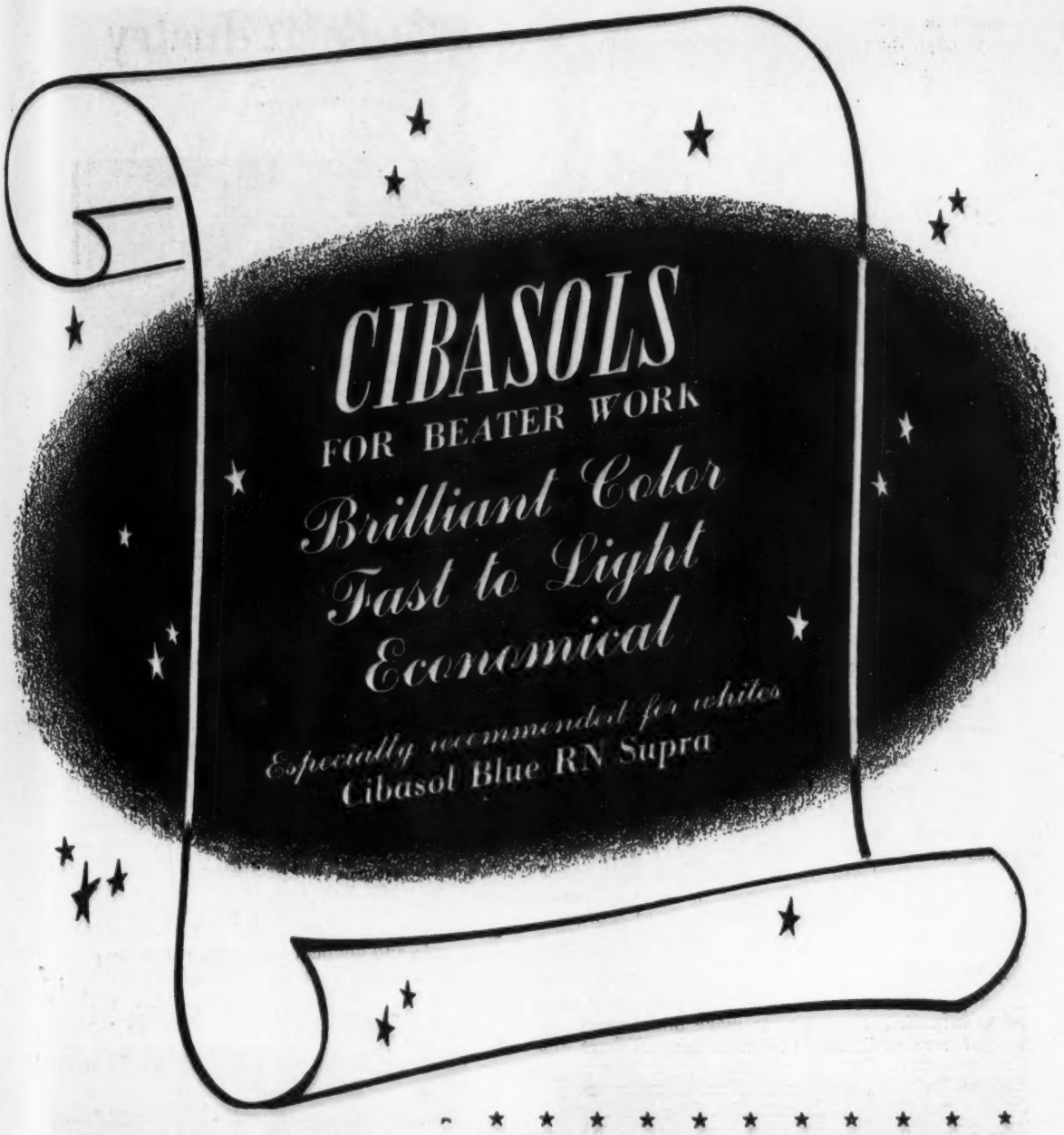
FIG. 2

View of Main Alley-Way Showing Screw Conveyors for Moving Carbon Black to Packing House. Each Conveyor Tube Takes the Product of a Separate Unit

Continental paper blacks can be added directly to the beaters in the original bag containers in which they are shipped. If the hood covering the beater rolls is sufficiently large (as is the case with newer equipment), the dust formed when the bag containing the carbon black splits under the action of the beater rolls is adequately trapped. With many of the older types of beaters, it is advisable to wet out the carbon black before adding it to the beater, to prevent the black dust from interfering with the lighter papers which are being prepared in nearby machines. Wetting out the black may be accomplished in a separate vat with or without the use of a slow-speed stirrer. In the latter case the black can be poured

FIG. 3

Carbon Black Is Produced by Burning Natural Gas in a Controlled Amount of Air. Here the Operator Reads the Meter Chart to Determine the Gas Flow



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carefully on to the water and allowed to wet by settling through the surface. For this method of application, Continental Semi-compressed is recommended, as its greater density results in more rapid settling through the water surface. Tests made at the Continental Laboratory show only a small difference between the rate of wetting of black by pure water and by various solutions. Dilute sodium carbonate solutions and also lime water, which at times have been used to aid in wetting out, appear to wet no more rapidly than pure water. Certain salt solutions such as alum, $FeCl_3$ and $CaCl_2$ do seem to give slightly better wetting than water alone. Organic wetting agents can not be used in most cases because of their adverse effect on size. When possible, the practice of adding the alum requirements of the batch to the water used in wetting the carbon black is helpful. A typical formulation based on this procedure is:

Water	100
Continental semi-compressed	3
Alum (amount required for total beater batch) about	3

Once the black is completely wetted, no more trouble should be experienced with dust.

Continental P has been designed to reduce dust in the dry state to a minimum without any sacrifice in dispersibility. Continental P is recommended wherever dust from the dry black has been found bothersome.

In general, it is advisable to add the carbon black to the pulp in the beater before adding the rosin or other sizing agent. If the order of addition is reversed, the size coats the pulp fibers and interferes with the fixing of the carbon black on the surface of the fiber.

Dispersion of the Pigment in the Pulp

Complete dispersion is necessary to bring out the full intensity of color and to prevent the presence of specks in the final product. For Continental paper grades the ordinary action of the beater is sufficient to form excellent dispersions in the customary paper furnishes (formulas). However, all carbon blacks require the presence of a small amount of inorganic salt in order to obtain satisfactory dispersion. The higher the valence of the positive ion of a salt, the more effective the salt in dispersing carbon black. Most paper furnishes contain alum for sizing purposes in sufficient quantity to make unnecessary the use of any additional inorganic salt. Where the alum content of the furnish is very low, enough additional salt should be added to obtain a total salt concentration of at least 0.8% by weight of the pulp. At the present time, with aluminum salts on the critical list, ferric chloride or even calcium chloride can be substituted for the alum insofar as dispersion of the black is concerned.

FIG. 4

Inside the Burner Houses Night and Day 1,185,840 of These Small Flames Are Playing on Moving Steel Channels and Depositing Their Quota of Black, Which Is Removed by Stationary Scrapers

Some black pigment is unavoidably carried off in the black water which drains through the Fourdrinier screen. This loss, however, is not considered excessive if held below 10% of the original pigment added. Both pulp and pigment loss can be reduced by passing the black water through one of the standard types of Save-all. In many factories it has been found possible to use the black water in the preparation of

FIG. 5

The Black Is Subjected to an Agitating Process in These Huge Agitators, Which Remove the Air from the Black and Control Its Density So That It Can Be Packed with Complete Accuracy in Volume and Weight

FIG. 6

Packing and Weighing. Precision Equipment Is Employed So That When the Black Is Used by the Bagful in Customer's Formula It Can Be Relied Upon to Give Expected Results. These Bags Are Then Overslipped with Other Bags for Cleanliness and Protection in Handling

PUT *Beckman* pH CONTROL TO WORK IN *YOUR* PLANT

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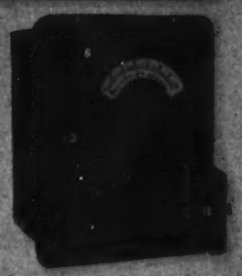

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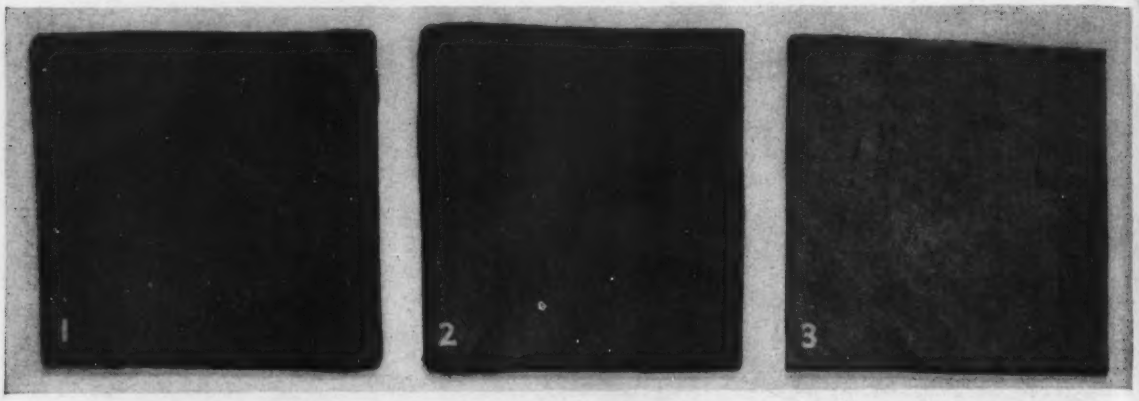


FIG. 7

Samples Show Effect on Color Resulting from Differences in Dispersibility of Various Grades of Carbon Black. Sample 1, Regular Uncompressed Black; Sample 2, Continental P; Sample 3, Ordinary Color Black

subsequent batches, thereby employing essentially a closed system and eliminating all black water losses.

In the manufacture of black paper, problems sometimes arise due to special production conditions, type of pulp and furnish used, etc. The Continental Carbon Laboratory always welcomes the opportunity of cooperating with the industry in the solution of such problems.

Sandy Hill Gets Renewal Star

One of the few industrial plants in the third naval district to receive the Navy "E" renewal star from the Navy Board of Production Awards is the Sandy Hill Iron and Brass Works, Hudson Falls, which in peace time is a leading producer of pulp and paper making machinery. The white-starred blue burgee replaces the plain pennant which was hoisted to full staff by Admiral H. A. Wiley, chairman of the Navy Board for Production, some months ago.

"On behalf of the Under Secretary of the Navy, I congratulate each and every one of the employees upon their continued splendid achievement in outstanding production," Admiral Wiley wrote Frank A. Juckett, president of the Sandy Hill organization. "This award is difficult to win in the first instance, and requirements for renewal are equally exacting. By winning this additional honor, you all have demonstrated a solid determination to supply our fighting forces with the materials they must have to bring this war to a successful conclusion."

At Sandy Hill, where thousands of square feet of added floor space and much new equipment have been devoted to navy production 24 hours a day, seven days a week, the problem of arranging simple ceremonies for the presentation, without interfering with operations, was a big one. Executives and personnel seemed agreed that, great as the honor was, it was more important to keep production rolling.

The annual employe dinner, which was inaugurated years ago by Mr. Juckett and J. Wesley Joslyn, Vice President, as a fall event at which venison was the piece de resistance, may be decided on as the event for the brief formal ceremonies. This dinner will take place early in December. Places will be laid for many more employee-guests than attended the first of this series of dinners, because of the great growth in personnel at the plant.

Sandy Hill executives shared credit for the achievements which won the renewal star with 35 sub-contractors connected with the Adirondack Pool, and others. Their loyalty and cooperation, Mr. Juckett said, equalled that of the Sandy Hill employees in bringing about the high production record resulting in the award.

A dinner for the sub-contractors, many of them manufacturers of paper and pulp mill equipment, and other paper makers, will be given by The Sandy Hill Iron and Brass Works November 19.

The company set a precedent by arranging its work schedules so that employes working on Sunday might attend church on company time. It numbers among its greatly expanded employe list a clergyman, the Rev. Miles Snowman, who preaches on Sundays, works in the erecting department of the plant on weekdays.

To Control Patents

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 23, 1942 — All transactions between private persons or companies involving U. S. patents and copyrights now are subject to control by Leo T. Crowley, Alien Property Custodian, it has been announced. Heretofore, this control rested in the Treasury Department.

All patent applications, assignments, licenses, and other agreements affecting foreign-owned patents are included in the controls.

The Custodian has issued three general orders, Nos. 11, 12 and 13, and supplementary regulations setting up a complete regulatory system for transactions that are subject to his control.

An exception from the prohibitions of the orders is made in the case of persons residing in this country December 7, 1941. Thus, enemy nationals who are resident in this country, many of whom have long been employed in our large research laboratories in perfectly legitimate capacities, will be free to deal with their inventions as they wish,.

A regulation issued under General Order No. 11 authorizes on certain conditions transactions forbidden by the Order. Thus, the filing and prosecution of patent and trademark applications and the receipt of letters patent and trademark registrations are permitted provided that the applicant, assignee or attorney attach to the first paper filed a report of certain information regarding the application.

E. M. Little Resigns War Post

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 23, 1942.—Quite a sensation has been caused here by the resignation from the board of Directors of National Selective Service of Elliott M. Little, general manager of the Anglo-Canadian Pulp and Paper Mills, Limited, Quebec. Mr. Little, who was "on loan" to the government to carry out one of the most difficult problems connected with Canada's war effort, had for many months past been working with great zeal to put into effect the government's plans for drafting men from "non-essential" industries into industries working on war orders and into the ranks of the military forces. A strong man was needed for the job, and Mr. Little proved to be that strong man. He showed great impartiality in the work, and it was to be noted that the measures he adopted affected the pulp and paper industry quite as severely as they did other industries. Not only did he work early and late at his job, but in addition he addressed many representative public bodies on the subject, his addresses being concise, logical, and forthright. He made no effort to minimize the serious effect of the provisions to be adopted, nor did he hesitate to announce the expensive nature of the reassignments under war. In his letter of resignation he said:

"In the fourth year of war we find ourselves with no clear directive from the Government on manpower policy and with quite inadequate organization to achieve a total and balanced manpower effort.

"As director of National Selective Service, I find myself carrying grave responsibilities without commensurate authority. The present situation is one of ambiguous and divided authority, which has led progressively from confusion to friction and obstructionism. The result has been virtual paralysis in the organization."

His resignation has precipitated a political crisis and brought to a head a long-standing controversy in which strong criticism has been made of the alleged ineffectiveness of the man-power policy. One result to date has been pronouncements by the heads of labor organizations supporting Mr. Little's stand and expressing regret at the circumstances which compelled him to resign.

Work of the Import Committee

Three decisions have been reached by customs officials on the classification of various imported papers and paperboards according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

Printed pages of a religious encyclopaedia which were believed to be dutiable as India or bible paper, have been held to be dutiable at a lower rate than that provided for India bible paper. The paper on which the sheets were printed was of a low grade of bible paper, and without the printing would weigh under the 20½ pounds provided as a maximum for bible paper. In their printed condition, however, as imported, the weight was above this figure, and the officials decided that they must be governed by the weight of the material as imported. In other previous cases the same principle has been applied to the advantage of the domestic industry.

Canadian laminated wallboard, consisting of five layers of pulpboard laminated with asphalt, to be used as facing for imitation brick facing entered as plain paperboard at 10 percent, has been classified as laminated board at $14.50 per ton, but not more than 30 percent ad valorem. The material was entered at less than $30 per 1,000 board feet.

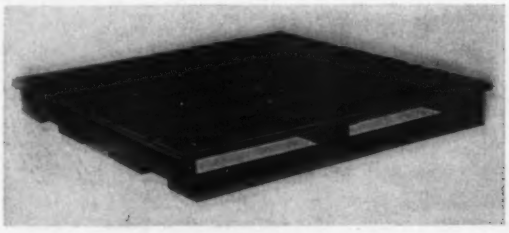
Asbestos sheets from Canada have been classified at the rate for manufacturers of asbestos at 25 percent. The material was under question inasmuch as the Tariff Act provides no specific rate for asbestos paper, and the Customs officials believed that it might be dutiable as paper not specially provided for at 30 percent. Upon a study of the discussions in Congress when the Act was passed, it was found that the legislative intent was to include such material in the asbestos paragraph, and the material was admitted at the lower rate on the basis of the meaning, not the text, of the Tariff Act.

All of these decisions were in harmony with the opinion of the Import Committee.

New Type Pallet Conserves Steel

The Union Metal Manufacturing Company of Canton, Ohio, maker of steel skids, boxes, pallets, and other materials handling units, has announced a new product, specifically designed to aid the nation's war effort.

This new product is a sturdy pallet, consisting of



HAS TOP AND BOTTOM WOOD SLATS

top and bottom wood slats, reinforced with steel at the ends and in the center. Bolted construction permits easy replacement of the wood slats, while the steel ends protect the pallet from damage by power fork trucks.

Vital metal is thus conserved without sacrificing strength and all-around usefulness, and ease of handling is preserved. According to the manufacturer, these new pallets are available in sizes to meet any ordinary materials handling requirement.

Simplified Practice for Insulation

Printed copies of the revision of Simplified Practice Recommendation R179-42, Structural Insulating Board (Vegetable Fiber), are now available, according to an announcement of the Division of Simplified Practice, National Bureau of Standards.

The current revision adds to the schedule of recommended standards, one size of building board, 4 feet by 6 feet, in ½-, ¾-, and 1-inch thicknesses; also it eliminates the 3-foot by 8-foot sheathing, ½ inch thick.

Copies of this recommendation, effective from June 1, 1942, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

Community Dependency in United States On Paper and Pulp Industry

The extent to which the American paper and pulp industry is a source of support to the cities and towns in which they are situated is not widely known. Although the statement that the paper and pulp industry gives employment to some 300,000 persons and paid out $300,000,000 or more in wages and salaries is impressive, the actual economic status of the industry is not adequately presented by these overall figures. A more complete understanding of the contribution of the industry to the national economy is factually given in "A study of community dependency on the primary paper and pulp industry," recently issued by the American Paper and Pulp Association.

Mills Employ 185,719 Persons

The following table shows that this study gives the total number of paper and pulp mills, in 36 states, in 511 cities and towns and the District of Columbia. These mills employed 185,719 persons, and the number of additional persons dependent upon the industry is estimated at 913,058, out of total population of 31,154,890. The total number employed and dependent upon the industry was estimated in May, 1942, at 1,098,757, or about 1 in 130 persons in the country. The primary paper and pulp mills are only considered in this study, excepting such primary mills as do converting operations. No strictly paper converting plant is included.

SUMMARY OF DEPENDENCY BY STATES

State	No. of towns with paper and pulp mills	No. of paper and pulp mills	Total employed by paper and pulp mills	Additional persons dependent on mills
Alabama	3	10	2,784	10,858
Arkansas	2	4	1,862	7,374
California	9	12	2,015	12,876
Colorado	1	1	100	633
Connecticut	16	28	2,398	9,642
Delaware	4	6	510	2,381
Dist. of Col.	1	1	165	1,328
Florida	6	12	3,667	22,221
Georgia	5	6	2,545	10,027
Illinois	19	27	4,702	24,165
Indiana	18	20	2,858	16,349
Iowa	3	3	426	1,875
Kansas	2	2	316	1,624
Louisiana	8	16	7,158	34,430
Maine	29	55	14,378	59,494
Maryland	8	9	2,980	15,288
Massachusetts	40	89	13,795	93,804
Michigan	29	68	13,263	56,492
Minnesota	8	21	4,029	20,063
Mississippi	4	7	2,035	6,655
Missouri	2	2	168	840
New Hampshire	19	36	6,039	25,365
New Jersey	27	41	6,179	37,695
New York	81	158	17,754	104,741
North Carolina	7	11	5,827	21,209
Ohio	34	54	10,386	52,965
Oregon	7	17	3,516	12,622
Pennsylvania	39	68	12,795	67,430
Rhode Island	1	1	200	880
South Carolina	3	7	2,533	8,612
Tennessee	6	11	1,607	7,038
Texas	4	6	915	4,749
Vermont	7	13	1,088	4,821
Virginia	11	24	6,128	27,210
Washington	13	33	12,102	62,567
West Virginia	3	5	523	2,824
Wisconsin	33	84	15,973	63,892
Total	511	969	185,719	913,038

The association's study shows that 83% of the primary paper and pulp mills is concentrated in communities with a population under 50,000; 58% in communities with less than 10,000 population; 44% in towns with less than 5,000 population; 15% in towns with less than 1,000 population, while 8% of the mills are in communities with less than 500 population. The population group of 1,000 to 5,000 shows the heaviest concentration. A summary of the community dependency groups are as follows: 90-100% are dependent upon paper and pulp mills in 121 towns and cities; 70-90% are dependent upon mills in 28 towns; 50-70% in 27 towns; 25-50% in 71 towns, and up to 29% are dependent in the industry in 264 towns and cities. In New York State, (158 mills) 90-100% dependency is estimated for a total of 23 towns, with an aggregate population of 2,816, or 28% of the total mill towns; 70-90% dependency for 6 towns, with a total population of 14,625, or 7% of the total mill towns; 50-70% for 7 towns of 25,750 population, or 9% of the total mill towns, and up to 25% dependency for a total of 41 towns, with a total population of 8,534,815, or 51% of the total mill towns; grand total, 41 towns; population 8,534,815, or 51% of all mill towns.

Dependency in Wisconsin

In Wisconsin, (84 mills), 90-100% dependency is estimated for a total of 9 towns, with a total population of 9,901, or 27% of the total mill towns; 50-70% dependency for a total of 5 towns, with a total population of 28,901, or 15% of the total mill towns; 25-50% dependency for a total of 7 towns, with a total population of 43,568, or 21% of the total mill towns: grand total, 12 towns, population 779,215, or 37% of all mill towns.

Dependency in Pennsylvania

In Pennsylvania, (68 mills), 90-100% dependency is estimated for a total of 10 towns, with a total population of 5,472, or 26% of the total mill towns; 70-90% dependency for a total of 5 towns, with a total population of 7,547, or 13% of the total mill towns; 50-70% dependency for a total of 3 towns, with a total population of 15,998, or 8% of the total mill towns, and 25-50% dependency for a total of 3 towns, with a total population of 14,543, or 8% of the total mill towns: grand total, 18 towns; population 2,436,077, or 45% of all mill towns.

The figures given, are of course not an exact measurement of dependency but are as accurate as practicable and may be accepted as sufficient for all practical purposes. The conclusion to be drawn from this study apparently may be summed up in the statement that, paper and pulp mills in the United States contribute largely to the welfare of the nation by furnishing steady employment, and frequently the only steady employment, in the centers in which they are located. Furthermore, the closing of these mills must inevitably create a deterrent effect upon the social and economic status of most mill towns.

Forest Resources of South Hold Amazing Potentialities for Industry

By Warren T. White, Genl. Industrial Agent, Seaboard Air Line Railway

During the past five years more progress has been made in the advancement of forestry in the South than at any other time during the history of this area. While this progress is no doubt the cumulative result of many factors operating towards improvement in forestry practices, one of the major reasons for the recent pronounced and rapid advancement of sound forestry in the area can be attributed to the wave of pulp and paper construction which occurred from 1935 to 1941. During this period nineteen new pulp and paper mills were built in the South, entailing investments in mill properties and timber lands aggregating in excess of $125,000,000. The increased demand for timber naturally created great interest in the question of future timber supply. At the height of this new construction, considerable criticism was directed at some of the pulp and paper companies and their cutting methods.

WARREN T. WHITE

Fear was expressed that the building of these huge pulp mills, with their consequent drain upon the timber resources, would in a few years result in the devastation of our forests, exhaustion of timber supplies and the closing of these pulp mills, as well as other wood-using industries. Subsequent activities on the part of pulp and paper companies in the territory in support of a sound forestry policy have refuted this idea and, to a very large extent, have dispelled any fear of a timber shortage. In fact, the pulp and paper mills generally are credited with having made an outstanding contribution to the advancement of forestry noted in recent years. Prior to their coming, there was a lack of a well-rounded market for trees. The pulp mills now furnish a market for small timber, thereby making thinning a profitable operation. With markets available for all classes of timber, fully integrated management of forest lands is now commercially possible. This means production of trees to be used for lumber, poles, piling, plywood, cross ties, naval stores, pulpwood, fuel wood, etc.

It has been frequently said that, given proper incentive, the American people will overcome any obstacle. The truth of this statement is being illustrated in the increased practice of sound forestry in the South. Every forestry enthusiast knows how difficult it has been in times past to get landowners generally to adopt the elemental principles of timber conservation. The exploitation and waste resulting from the old "cut out and get out" policy followed by most of the large saw mills of a generation ago are poignantly fresh in the minds of most students of forestry. By the early 1920's, most of the virgin areas had been cut over, leaving many millions of acres of timber lands unproductive from the viewpoint of the average saw mill operator. Notwithstanding the efforts of the United States Forest Service, State Forestry agencies and others interested in timber conservation, most of these cut-over areas were subject to the annual devastation of uncontrolled fires. In many instances the landowners themselves set fire to woodland areas in the mistaken belief that burning improved the land for cattle grazing. With a few exceptions, such as parts of the longleaf and slash pine belts of north Florida and south Georgia where the production of naval stores centers, little importance was attached to the value of second growth pine. This situation continued until the pulp mills came and breathed new value into the millions of acres of second-growth land, which up to that time were regarded as of little worth. The pulp and paper mills proved that there is no incentive so powerful as the ring of the cash register. With the establishment of a market for his trees, the landowner became interested in protecting the forests from fire.

The United States Forest Service and the various State Forestry departments—organizations which, by the way, had long recognized the serious aspects of the forest problem in the South—were quick to sense the rising tide of interest in forestry and to seize upon the opportunity presented for furthering sound forestry practice. The pulp and paper companies, lumber companies, individual landowners and many others readily gave their cooperation in constructive efforts to insure a timber supply adequate to present and future needs.

More Forest Minded Than Ever in History

On the whole, it can be safely said that landowners in the South are now more forestry-minded than at

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Mr. White is a recognized authority on the pulp and paper resources of the South. The Industrial Department of the Seaboard, under his direction, has pioneered in the development of the pulp and paper industry in the Southeast, and during the past six years 13 large pulp and paper mills have been constructed in states served by the Seaboard Air Line. The Seaboard enjoys the unique distinction of having its own forestry department, set up under Mr. White's jurisdiction, for the purpose of promoting sound forestry in the six southeastern states served by the railway.—Editor, PAPER TRADE JOURNAL.

any other time in history. They are alive to the needs of the occasion and a broad conservation program is in the making. Many landowners have learned in recent years that our forests are a renewable resource and that the way to get the most out of timber is to treat it as a crop. They are learning that with proper forest management it is entirely feasible to supply all wood-using industries with their timber requirements without hurt to any one particular class. Landowners in increasing numbers are learning that it pays to operate their forest properties on the sustained yield basis.

Although the kraft paper industry had its inception in the South more than a generation ago, it was not until the late 1930's that the industry in this area assumed such commanding proportions. In 1941 the South's pulp production was over forty-three per cent of the Nation's total, more than double that of any other section of the United States. This compares with only twenty-four and one-half per cent in 1936. Practically all the growth in the industry during the past six years has been in the southern states. This recent expansion in the South has made us independent of foreign sources of pulp and, with the exception of newsprint imports from Canada and Newfoundland, the paper industry in the United States can now be considered self-contained. In fact, we have recently made considerable exports, mainly as the result of dislocations incident to the war.

Adapted for Any Kind of Paper

While the bulk of production in the South is still in kraft, the manufacture of various grades of white paper is on the increase and the production of sulphite pulp has assumed important proportions. There no longer remains any doubt as to the adaptability of southern pine for the manufacture of any kind of paper made from woodpulp.

In addition to the conventional uses of pulp, such as the manufacture of paper, bags, cartons, packages, etc., there is a constant demand for pulpwood in the manufacture of rayon, plastics, cellophane, artificial wool, films, lacquers and many other kindred products. Under the magic wand of the chemist, new fields of industrial utilization are continually being explored in the realm of wood cellulose, resulting in the creation of new processes and new products, all based ultimately on wood fiber as the principal raw material. Only twenty years ago the manufacture of rayon as a substitute for silk became a commercial reality. Rayon is no longer regarded as a substitute for anything but has developed into a fabric with characteristics all its own, and will compare favorably in many points with silk and, indeed, in some respects is superior thereto. From an annual production of 70,000 tons in 1924 the industry has grown until world production in rayon in 1941 reached the astounding figure of 550,000 tons. In the early days of the industry cotton linters constituted the principal source of cellulose for rayon manufacture. Today ninety per cent of the rayon manufactured is derived from wood pulp. Staple fiber, often referred to as "artificial wool" furnishes an even more astonishing record; its production was only 4,000 tons ten years ago. In 1940 world production amounted to 600,000 tons. This fiber, too, is derived from wood.

Big Field in Plastics

In the field of plastics—which, by the way, is in its infancy—wood cellulose is being used in increasing quantities. The ramifications of this industry extend into so many products that it would be difficult to even hazard an estimate as to future tonnage require-

A Good Example of Selective Cutting

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ments. Wood cellulose is being used commercially in this country for almost every human need except food, and it is reliably reported that it is being used in Germany for the production of sugar and proteins possessing all the nutrient equivalents of ordinary sugar and proteins derived from customary sources. The following quotation from an article entitled, "The Rediscovery of Wood," by Elrick B. Davis in the September issue of *American Forests* indicates the extent to which the Germans have gone in the utilization of wood:

"Clad in fabrics produced from wood; living on wood sugar, wood proteins, and meat and cheese from wood-fed cattle, with a schnapps ration made from "grain" alcohol obtained from sawdust—German soldiers move to the Russian battle lines in wood-gas-driven trucks which are greased with tree-stump lubricants and run on Buna tires made from wood alcohol.

"Spreading misery and destruction with explosives manufactured from the waste liquors of woodpulp mills, they are assisted in their nefarious work by squadrons of plywood planes, while the German propaganda division takes a motion-picture record of selected items of the action on film made of wood cellulose acetate."

But for the Germans' ability to substitute these "ersatz" materials for ordinary food products, Hitler's war effort would long since have fallen about his ears like a house of cards.

German research cannot achieve any industrial miracles which cannot be equalled, if not exceeded, by our own chemists, and while there is no necessity for our resorting to wood cellulose as a basic material for the production of food, these developments do illustrate some of the vast possibilities inherent in the chemistry of wood cellulose. The production of wood pulp as a basic material used in the manufacture of powder and explosives is playing a vitally important part in our war effort.

No Fear of Forest Depletion

Our National Government has designated timber as one of the vital resources essential to the war effort. With the present unprecedented demand for lumber, poles, piling and other forest products, the fear has again been expressed in some quarters that our forests will be depleted beyond their capacity to recover and sustain in future years those industries dependent upon timber. While it is a fact that we are drawing rather heavily upon our forests, it is not believed that these fears are justified. The principal demand is for lumber and the National Program calls for a production of thirty-nine billion feet for 1942. While it appears that the output will probably fall

A Stand of Longleaf Pine Just Prior to a Pulpwood Thinning Operation

A Typical Second-Growth of Longleaf Pine

somewhat under that figure, the expectant deficit is not attributed to a lack of timber but to shortages of facilities and manpower in certain areas. When it is recalled that this figure constitutes only two per cent of the 1,700 billion feet of standing timber, there would appear no logical ground for alarm over the question of future timber supply. The conservation measures now being effectuated in the South, and which have a counter-part in similar activities in the Pacific northwest, should serve to reassure in this matter.

Have Acquired Large Acreages

Most of the pulp and paper companies operating in the South have acquired large acreages of standing timber, to serve not only as a present supply for a part of their requirements, but to constitute a back-log, so to speak, against future demands. Recent statistics from the Atlanta office of the United States Forest Service covering ten southern states show that pulp and paper companies own in fee simple almost five million acres of timber lands. These companies have taken the lead in the establishment of forestry programs and have instituted sound measures including the selective cutting of timber. Furthermore, most of these companies have set up forestry organizations whose activities include assistance to other landowners in territory tributary to the mills. In some instances the companies make a practice of blocking out sufficient wood to meet requirements of the mills for months in advance.

In Business of Timber Growing

Southern pulp and paper mills, generally regarded as the first southern forest industry to adopt sound and constructive forestry regulations for timber cutting, organized in 1939 the Southern Pulpwood Conservation Association, headed by a competent and experienced forester, to collectively promote constructive forestry education among its various members and landowners generally throughout the South. A point frequently overlooked, and which has been emphasized by the Pulpwood Association, is that when a paper company buys timber lands and inaugurates a forestry program, that company is then engaged primarily in the business of *timber growing* and secondarily in pulpwood production. That is, trees suitable for higher priced commodities such as poles, piling, sawlogs, etc., are disposed of for the highest cash return. Pulpwood, generally speaking is derived from the poor trees, salvaged timbers, portions of trees which cannot be sold for any other use and from thinning operations. The Regional office, United States Forest Service, Atlanta, Ga., has rendered effective assistance and cooperation by assigning a man who spends his full time going about the

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South working with the pulp mills on this program of selective cutting. In this connection, it is pertinent to point out that a very small percentage of the timber drain in the South goes for pulpwood, amounting to approximately six per cent of the annual drain.

Fire Worst Enemy of Forests

Fire is by far the worst enemy of the forests. The loss from fire constitutes our largest mortality drain. Fire prevention, a prerequisite to any worthwhile forestry program, is rated as problem number one in the South. Federal and State Forestry agencies, railroads, counties, individual companies and others are engaging in a concerted effort to bring about universal fire protection. It is realized that the problem is largely one of education and the details of the work are too numerous to relate. Suffice it to say that definite progress is being made.

Demonstration plots have been established by many of the pulp and paper companies, illustrating the principles of selective cutting and other sound forestry practice. These demonstrations, together with operations of the various companies on their own timber lands, constitute visible proof of the claims made concerning the benefits to be derived from approved conservation measures. There are, of course, many instances where approved cutting methods are not followed. In some areas fire still takes an appalling toll annually, but when one compares the situation as it exists today with that of twenty years ago, or even ten years ago, very definite and encouraging progress can be noted, enough in fact to warrant the prediction that the cumulative efforts of all concerned will in the future solve the forest problems of the South to the end that an adequate supply of timber will be provided for all needs.

A Second-Growth Stand of Longleaf Pine Several Years after a Pulpwood Thinning Operation. Protected from Forest Fires This Forest Area Will Produce Well Over One Cord per Acre per Year.

A Typical South Georgia Woods Trail

Perpetual Supply of Raw Material

There are more than two hundred million acres of forest land in the South, the major portion of which are in pine. The capacity for quick reproduction holds prospects of a perpetual supply of this cheap raw material. After all, the basic resources here involved are good soil, ample rainfall, sunshine, long growing season and fast growing species. These items constitute the mechanism of the world's largest factory, a "plant" extending over eleven states, comprising in excess of two hundred million acres of "floor space" having an output of wood cellulose measured in billions of cubic feet per annum. Under such favorable conditions as exist in this area, pines often attain pulpwood size in fifteen to twenty years. Given only a reasonable degree of intelligent management, the forests of the South are capable of sustaining wood-using industries requiring three times the present volume of timber. Under intensive methods, the output might well be increased five times the present capacity.

Shortage After the War

After this war is over there will be a shortage of everything. Millions of men will be diverted from war to the pursuits of peace. New industries will be established, large quantities of construction materials will be required and there will be a rush to supply an almost endless list of consumer articles needful to the comfort and convenience of every day life. In view of the almost unlimited uses to which wood cellulose is being put, no other resource offers opportunity for such widespread industrial development as the growing forests of the South. While we think of the recent developments as spectacular, they appear small as compared with reasonable prospects for future expansion. We have the statement from none other than Dr. Charles M. A. Stine, famous chemist and vice-president of E. I. du Pont de Nemours & Com-

pany, to the effect that the newest and most versatile of plastics will be available after this war on a scale beyond all previous conceptions.

More Pulp and Paper Mills for the South

That additional pulp and paper mills will be built in the South is a practical certainty; that the development of industries in the field of plastics, synthetic fibers and kindred lines will bring undreamed of demands on our southern forests is a reasonable prospect. It is, therefore, difficult to predict the prospective future limits of forest production in the South. An estimate three times the present drain within the next generation would appear to be conservative. But whatever these demands may add up to, the South with her vast forests is capable of supplying wood cellulose for all of our requirements. Our fast growing pine seems destined to bring almost fabulous wealth to this area. Fortunately, there now exists a widespread sentiment among landowners and business interests generally throughout the South in favor of those steps necessary to the conservation and perpetuation of these forest resources.

Amplidyne-Electronic Equipment Increases Versatility of Paper Machine

By G. V. Kullgren, Industrial Engineering Dept., General Electric Co.

A control system recently installed on a paper-making machine at the Mead Corporation, Chillicothe, Ohio, combines an amplidyne generator and an electronic speed regulator to permit operation of the machine at speeds as high as 750 feet per minute and as low as 75 feet per minute. This wide range of speed has greatly increased the versatility of the machine, as it is now possible to produce many different grades of paper on the one machine.

Earlier Control

Before the installation of the amplidyne-electronic control system, which was built by the General Electric Company, speed was controlled by a simple motor-operated rheostat. However, considerable trouble was experienced at paper speeds below 150 fpm with this method, since the rheostat could not compensate for changes in load, and even slight changes resulted in appreciable speed variation.

Although it would have been possible, through a two-speed gear or a jackshaft with double pulley reduction, to connect the motor to the line shaft and thus get the entire range in speed, this would have been costly, in addition to offering many intricate mechanical problems.

The new control system, see Figs. 1, 2 and 3, however, holds speed stable at any point in the entire speed range of 75 to 750 fpm and constitutes a relatively inexpensive solution to the problem.

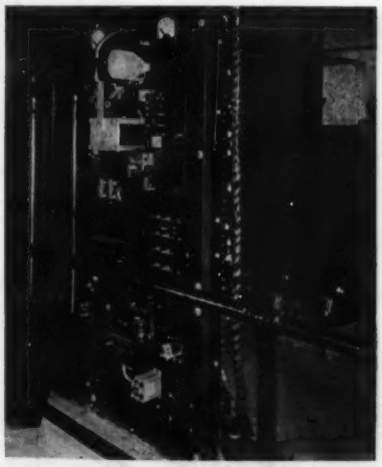

FIG. 3
New Control Panel with Corner Removed from Electronic Regulator at Bottom of Panel and Showing Amplidyne Set in Background

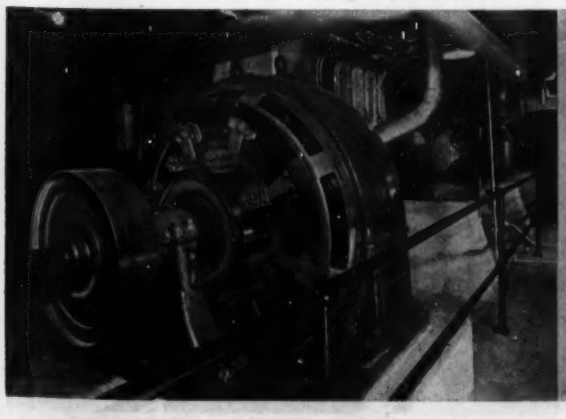

FIG. 1
Main D-C Driving Motor in Line Shaft of Paper Machine

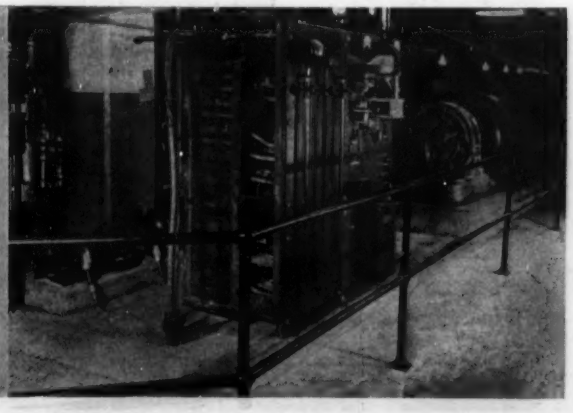

FIG. 2
View of New Control Panel Mounted Alongside of Old Rheostat. Amplidyne Set to Left, Rear. Main Motor-Generator Set on Right

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VICTORY

Accidents Loom in Manpower Problem of Paper and Pulp Industry

By Roy K. Ferguson, Pres., St. Regis Paper Co., and Chairman Paper and Pulp Committee War Production Fund

Since Pearl Harbor more American workmen have been killed by accidents than men in action on all far-flung fronts and oceans where the Stars and Stripes now waves. By the first of November the toll in labor's ranks had risen to 43,000 fatalities, and the great surge of mortality rolls on. In battle something less than 6000 American boys are known to have been killed in action.

In this respect the United States is running true to form—first in everything. We easily outstrip all other industrialized nations in our annual waste of manpower through preventable accidents. The accumulative personal tragedy is bad enough. But even more grisly is the drain on our industrial potential when we need every last ounce of strength and skill the home front can muster. Since Pearl Harbor 410,000,000 man-days have been dissipated by accidental death and injury.

Problem National in Scope

The problem is national in scope and effect. The President recognized it officially as such even when we were in the war. In a proclamation warning of the disaster of piled up carelessness, he called on the National Safety Council to curb the trend. Remedial measures have been taken, on an unprecedented scale.

Pulp and paper executives have taken a deep interest in these remedial proposals, which have stemmed from the Council's War Production Fund to Conserve Manpower, formed by business and industry to finance a nation-wide safety movement. On the pulp and paper division committee of the Fund, of which I am chairman, serving with me are: Folke Becker, president Rhinelander Paper Company; Alexander Calder, president Union Bag and Paper Corporation; J. M. Conway, president Hoberg Paper Mills; U. N. Dickey, president Soundview Pulp Company; D. C. Everest, president Marathon Paper Mills Company; Clifford W. Gaylord, president Gaylord Container Corporation; A. C. Gilbert, president Gilbert Paper Company; F. D. Gottwald, president The Albemarle Paper Manufacturing Company; R. A. Haywar, president Kalamazoo Vegetable and Parchment Company; E. C. Hilfert, general manager Riverside Paper Corporation; R. H. M. Robinson, president Minnesota and Ontario Paper Company; Arthur Schroeder, president Pejebscot Paper Company; John H. Smith, president Hawley Pulp and Paper Company; and Karl E. Stansbury, president Thilmany Pulp and Paper Company.

Position of the Paper Industry

By the very nature of its processes of manufacture, the paper and pulp industry has tended to fall within the worst third of American industrial accident experience. It is intrinsically more hazardous to work in a paper mill than, say, in a weave shed or a cement works. Where so much bulky material must be handled manually, where heavy pipe lines carry steam under pressure and strong acids, occasional slips must be expected. The only answer is relentless supervision and a planned course of employee instruction in accident-prevention.

Last year in frequency of accidents paper and pulp was the tenth most seriously affected in a listing of 32 typical industries. This frequency record was poorer than the metal products industry's, better than that of quarrying. In severity of accidents paper and pulp was eighth from the cellar. Public utilities did slightly better, steel slightly worse.

Through the years there has been a marked overall decline in paper and pulp's accident experience. In the past decade and a half accidents dwindled by two-thirds, thanks to the tenacity of management and the work of the National Safety Council. The severity of accidents likewise dropped by one-half, as measured in the number of days lost. But the recent gigantic adjustments of the industry as a whole to war seem to have had an adverse effect on paper and pulp's specific experience, for the long term improvement has abruptly ceased.

Competition for Labor

In 1940 began a great competition for labor which today has reached unprecedented extremes. At the same time all industry, including paper and pulp, began to make drastic alterations in production schedules in order to meet the searching needs of impending war. This worked a remarkable sea-change in paper and pulp's injury rates.

Since 1940 the frequency of accidents has shot up 38 per cent in the industry, severity of accidents 61 per cent. Compilations for this year are not available, but preliminary surveys show that no more than a leveling off of the sudden lapse can be anticipated at the moment.

The National Safety Council has made a survey of the paper and pulp accident situation, with 277 mills of all types reporting. Results show that small mills where safety programs are least developed have by far the worst records. Board mills have the highest injury rates, pulp mills the lowest in the breakdown of mills according to types. The Hollingsworth & Whitney Company at Winslow, Maine continues to hold the all-time no-injury record—3,343,623 man-hours worked without accident.

Comparison between recent accident frequency and severity of accident rates in pulp and paper and other typical industries are revealing. Between 1940 and 1941 frequency in paper and pulp role 11 per cent, in rubber 13 per cent, in chemicals 8 per cent, in steel 5 per cent, in woodworking 31 per cent and in lumbering—most dangerous of all industries—9 per cent. In severity, pulp and paper and steel were the only two to show increases.

The negative trend is clearly linked to a very great increase in all industrial operations in which pulp and

paper mills substantially shared. It has been impossible to foresee in concrete detail the responsibilities bred by the greatest conversion to wartime economy ever engineered by American industry.

A great influx (and turnover) of new employees, new installations to meet specific needs and a general speed up of all contributed to the toll. Neither the pulp and paper industry nor any other was completely prepared to measure up to the weighty safety problems that these wartime factors drew along in their wake. Box and container factories in particular suffered alarming increases in accidents, while sharp advances were also recorded in board mills.

In the pulp and paper industry the rooted cause of accidents varies widely, as indeed in all industry, from department to department. In machine rooms, for instance, nip accidents on paper machines, calenders and winders are commonest. Bad housekeeping conditions and sloppy handling of shafts and cores follow in order.

Slipping on Wet-Surfaces

Taking the paper and pulp industry in the broad, accidents caused by falling or slipping on wet surfaces cause the most trouble, accounting for 14 per cent of the total. It is plain that any industry using as much water as paper and pulp manufacture cannot guarantee dry footing for all employees. It is virtually impossible, for example, to have absolutely secure footing at all times at the wet end of paper machines and, again, floors must be washed down from time to time. Nor can woodpiles be kept free of ice and snow which make for treacherous footholds. The answer is probably more intensive supervision, within the mill and on stairways and loading platforms.

Nip accidents, which usually happen in the process of feeding and threading paper, can be controlled to a considerable degree. It is largely a question of drilling into the workman the necessity for using his wits at all times. A man who inserts paper into the nip with his fingers is bound to get caught sooner or later, and the same applies to anyone who attempts to pull wads out of winders, reels or felt rolls with his bare hands. The machine should be shut down, or some such tool as an air hose should be brought into play. And in using a hose or scraper around the nip with the machine in motion there is always the danger of having the operator's hand drawn in after the carelessly handled tool.

Next in importance are trucking accidents, largely caused by faulty operation, and accidents occuring during the handling of rolls, bales and bundles of paper and pulp. Ruptures an strains inevitably lame the worker who is not disciplined to use his body properly in lifting and tugging. A dangerous practice is to pile paper bales too high, and to ignore the terrible eye hazards involved in cutting bailing wire.

Working around the wood piles is one of the most dangerous jobs in the industry, especially during wet or icy weather. Failure to get the men in the clear when a slide comes has brought death to more than one man in the trimming gang. It is interesting to note that on the woodpiles the old hand is just as liable to accident as the green one, according to National Safety Council findings. It is obvious that lookouts should be posted during all blasting of frozen or jammed piles. Roughhousing and overconfidence have no place on the woodpile.

Pipe Line and Hose Accidents

Pipe line and hose accidents are usually caused by the failure of apparatus, rather than by carelessness, though the two factors can never be completely isolated. Frequent inspection of all pressure apparatus is necessary, for accidents stemming from failures in pipe lines, boilers and digesters are often fatal. The corrosive effect of acid on pipe lines must be constantly watched, and leaky fittings which might result in the spraying of the men with hot liquid or acid, or of searing their lungs with chlorine, need strict attention. Such accidents are not numerous, but very bad when the unexpected happens.

Of less importance in the paper and pulp industry are accidents around hoisting apparatus, those which follow from bad handling of shafts and cores and those happening when workmen become entangled with conveyor systems. Protective railings is the remedy called for in the last situation, and safety instruction for all situations appears to be the only panacea.

Latest figures show that on the average the industry had 17.37 injuries per million hours worked. This compares with 52.45 injuries per million hours worked in lumbering, the most dangerous industry, and with 3.23 for tobacco, the least dangerous. The severity of pulp and paper industry injuries runs around one and two-thirds days lost for every thousand hours of exposure. This compares with about nine and one-half days in mining, the worst offender on this score, and with one-fifth of day in tobacco, the industry with the best record.

The Drive to Curb Accidents

The pulp and paper industry is sharing in the benefits of the greatest drive to curb accidents in the history of America, now being directed by a notably expanded National Safety Council. The Council is being financed to meet its wartime assignment the War Production Fund to Conserve Manpower. The Fund, now seeking contributions from within business and industry, has already received nearly $1,200,000, of which $250,000 is already at work in the hands of the Council. A goal of $5,000,000 has been set. The Fund is currently in the midst of a regional campaign covering every major industrial center.

The experience of the paper and pulp industry makes it clear that to reduce manpower losses through accidents the problem must become a vital issue in the consciousness of every single worker on the home front. Until accidental death and injury are understood in their true light as the worst kind of waste—and waste as downright treason in America at war—the ground will never be cleared for the introduction of fruitful safety controls. It so happens that three out of five accidents happen off the job, which is additional argument for an inclusive, fundamental attack on the problem.

It is on this basis that the National Safety Council has moved into action. Technical services have, of course, been stepped up as more staff was hired. Safety engineer training programs have been put in operation in universities, colleges and trade schools from coast to coast. Aid has been given the Army in handling military traffic problems and the congestion that has hampered production in mushroom industrial areas. The shipyard accident situation has been surveyed, and contacts have been made with

many of the seven out of eight plants now having no adequate safety program.

Organizing Public Interest

But the biggest step forward has been taken in the field of organizing public interest. Over one hundred public and private groups, ranging from the War and Navy Departments to the National Council of Women, have been mobilized in a great campaign to outlaw accidents. It is from this awakening of the American consciousness that industry, including the paper and pulp industry, will reap the greatest long range benefits.

The re-energized safety movement is drawing strength from the conviction of every responsible industrial and business leader in the United States that the accident rate must be cut as a patriotic necessity. In eleven months after Pearl Harbor a grand total of 85,000 Americans killed, 7,700,000 injured with a loss of 410,000,000 man-days was rolled up. In the face of such provocation a powerful response was inevitable, once the gravity of the situation was made known.

Called into being by Presidential proclamation, the War Production Fund has been repeatedly endorsed by men of authority. Lt. Gen. Knudsen keynoted the opening of the drive for funds, and WPB's Donald Nelson wrote that "it is the bounden duty of American industry to enlist in the accident prevention program of the National Safety Council."

National chairman of the Fund is William A. Irvin, former president of the United States Steel Corporation, and Thomas W. Lamont of J. P. Morgan and Company is national treasurer. President of the National Safety Council's board of trustees, a non-paid supervisory body, is Col. John Stilwell, vice-president of Consolidated Edison Company. Ned H. Dearborn, formerly of the staff of New York University, is managing director of the thirty-year old Council.

Lake States TAPPI Hears Bob Canfield

The Lake State Section of the Technical Association of the Pulp and Paper Industries met at the Conway Hotel, Appleton, Wis., on November 10. The speaker was Robert Canfield, a member of Wise, Cortlett, and Canfield, counselors for the Groundwood Paper Manufacturers' Association, for the past ten years.

His talk dealt with the general economic conditions in the paper industry at the present time and the effect of war and postwar conditions upon the present and possible trends of the industry. He pointed out that up to about 1915 cultural papers were the main product of the industry; since that time, there has been an increasing production of mechanical papers (i. e., those used for wrapping, packing, etc.). The industry has been engaged in what the speaker termed "peddling" which is a practice that is successful as long as the demand for a given class of paper is constantly increasing. However, when the demand straightens out, there must be a different approach to the selling problem—it must be on a purely service basis. The two great problems facing the industry at the present time are taxes and price control. The situation has caused much of the industry to seek Government business; however, there is a real need for a continuous effort on the part of the industry to maintain its production for civilian consumption, quite apart from the Government orders. He pointed out the importance of paper in the normal operation of business and the many phases of life—both civilian and military—which it affects. Under the present economic conditions, the industry has no opportunity to raise prices, and there is no excuse to sell below the ceiling prices established by the Government simply to maintain a certain volume of business. Under such circumstances, there is more need than ever to operate from the service angle. This has been recognized by the Government, which is endeavoring to spread orders and may purchase at prices considerably above the lowest price quoted in order to keep mills operating in certain sections. In discussing post-war conditions, mention was made of the need for standardization of quality, sizes, etc., perfection of the manufacturing processes, and the great importance of waste utilization; he suggested the possibility that pulp might become a secondary product and that those obtained from a processing of the waste liquors would be of more value than the pulp itself (a condition which every pulp mill would like to exist but which, at present, seems to be a case of wishful thinking). He also pictured the industry as facing a greatly increased demand because of the new uses for paper which are being developed through the war program. As an evidence of this, he cited the work which is being done by the Pulp and Paper Section of the War Production Board and especially that of the new section which is headed by Mr. John G. Strange.

Those attending the meetings were: Francis F. Allard, Arnold G. Beaman, Paul Boronow, H. A. Chase, H. P. Dixon, James F. Ebert, Robert Canfield, G. F. Enderlein, Fred Esler, Martin L. Downs, L. V. Forman, H. V. Frederich, John H. Graff, John A. Hanson, John M. Hayes, E. G. Heberlein, E. C. Jacobi, Peter E. Jones, Otto Kuemmerling, Otto Kress, Clarence Kronquist, C. W. Larsen, A. Lewenstein, A. McPhillips, Carl Mystrom, T. A. Pascoe, P. A. Paulson, W. B. Pusey, E. W. Rasmussen, L. E. Russell, T. J. Russell, R. H. Siple, P. H. Tigwell, R. Tourangeau, Martin W. Van De Laarschat, J. A. Van den Akker, John P. Weidner, S. D. Wells and C. J. West.

New Line of Cutting Oils

Development of a new line of cutting oils which will help speed the American battle of production by increasing machine productivity in war industries is announced by Standard Oil Company of Indiana.

The new cutting oils permit faster speeds and new methods of tooling, closer tolerance in sizes and finishes, and increased use of alloy steels which have lower machinability ratings than the metals commonly encountered, according to Standard chemists and engineers who developed the new line in test plants and proved their worth by increasing production.

Many shops which formerly operated on a "job shop" basis are now specializing in war production and operate continuously on the same job. In such plants engineers are now able to prescribe the grade of cutting oil which will give the best results on a particular operation instead of a compromise product to fit the miscellaneous demands of a wide range of machine operations and metals as in the past, the company explained.

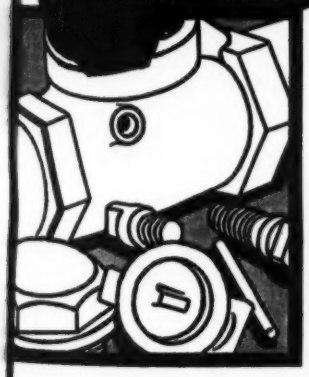
DOUBLE THE LIFE OF YOUR..

WALWORTH REGRINDING SWING CHECK VALVES (Nos. 420 and 428)

The useful life of a bronze swing check valve can often be doubled or even trebled by regrinding. A small scratch on the seat or disc may develop quickly into a deep fissure that no amount of regrinding can remove — therefore, do not put off regrinding.

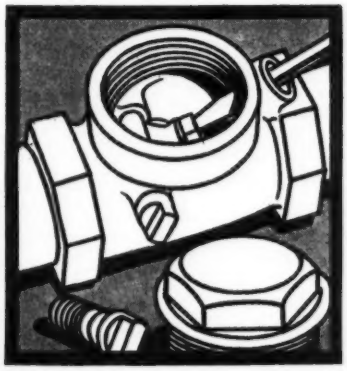
Walworth Regrinding Swing Check Valves Nos. 420 and 428 are designed to be ground without removing the valve body from the pipeline. Here's how:

A century ago Walworth [illegible] manufactured valves and fitting[illegible] Walworth has been manufacturing valves and fittings continuously ever since.



1 Shut off flow through pipe so that section being worked on is empty. (A) Remove the cap from the top of the valve and (B) remove stop plug on the downstream end of the valve; (C) remove plug on side of body and pull out hinge pin; (D) remove disc.

2 Apply grinding compound to disc and seat with finger. It is recommended that a grinding compound with an emery base be used



3 Replace disc and put screw driver through stop plug hole until screw driver fits into slot in top of disc stud. Oscillate disc until pitted surfaces are ground smooth.

4 Remove disc and wipe seat and disc with cloth dipped in gasoline — be sure all grinding compound is removed; then reassemble. Your valve is ready for additional useful service.

WALWORTH

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

VALVES
FITTINGS
and TOOLS
Backed by 100 Years' Service

DISTRIBUTORS IN PRINCIPAL
CENTERS THROUGHOUT THE WORLD

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending November 21, 1942

STOCKS

	High	Low	Last
A. P. W.	1¾	1½	1¾
Armstrong Cork Co.	31⅛	30¾	31
Celotex Corp.	7⅜	7¼	7⅜
Celotex Corp., pf.	70½	70	70
Certain-Teed Products Corp.	3⅛	3	3⅛
Certain-Teed Products Corp., pf.	31	29½	31
Champion Paper & Fibre Co.	18½	16¾	18½
Champion Paper & Fibre Co., pf.	100	99¾	99¾
Congoleum Nairn Co.	17	16⅜	16⅜
Container Corp. of America	15¾	14⅜	15¼
Continental-Diamond Fibre Co.	6⅞	6⅞	6⅞
Crown-Zellerbach Co.	11½	11	11¼
Crown-Zellerbach Co., pf.	82	81½	81½
Dixie-Vortex Co.	9¼	9¼	9¼
Dixie-Vortex Co.—A	36	34½	36
Flintkote Co.	14⅜	13½	14⅜
Flintkote Co., pf.	97	97	97
Robert Gair	1⅞	1⅜	1⅜
Robert Gair, pf.	9¼	9⅛	9⅛
International Paper Co.	8⅞	8	8½
International Paper Co., pf.	47	43¾	44⅞
Johns-Manville Corp.	67	64½	65½
Johns-Manville Corp., pf.	129	129	129
Kimberly Clark Corp.	....	....	....
MacAndrews & Forbes	18	17⅜	17¾
Masonite Corp.	28¼	27⅞	27⅞
Mead Corp.	6½	6¼	6¼
Mead Corp., pf.	70	70	70
Paraffine Companies, Inc.	32½	31⅛	32½
Paraffine Companies, Inc., pf.	101	101	101
Rayonier, Inc.	9¾	9¼	9⅜
Rayonier, Inc., pf.	26⅜	26	26
Ruberoid Co.	19½	18½	19½
Scott Paper Co.	38	37½	37⅞
Scott Paper Co., pf.	115	115	115
Sutherland Paper Co.	25	23½	25
Union Bag & Paper Corp.	8⅛	7⅞	8⅛
United Paperboard Co.	3¼	3¼	3¼
U. S. Gypsum Co.	59	57	58
U. S. Gypsum Co., pf.	174	172	174
West Virginia Pulp & Paper Co.	13	11½	11½
West Virginia Pulp & Paper Co., pf.	99½	99½	99½

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 4½s '47	98⅜	98¼	98¼
Certain-Teed Products Corp. 5½s '48	93½	91⅝	93
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	105	104⅞	105
International Paper Co. 5s '47	103¾	103¼	103¼
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103	103	103

New York Curb Exchange

High, Low and Last for Week Ending November 21, 1942

STOCKS

	High	Low	Last
American Box Board Co.	4⅜	4⅜	4⅜
Brown Co., pf.	....	....	....
Great Northern Paper Co.	27	26¼	26½
Hummel-Ross Fibre Corp.	3½	3¼	3½
National Container Corp.	9¼	9	9
St. Regis Paper Co.	1⅝	1½	1½
St. Regis Paper Co., pf.	119½	117	117
Taggart Corp.	2⅝	2⅜	2¾

BONDS

American Writing Paper Co. 6s '61	85	84¾	85

Sutherland Votes Dividend

The Sutherland Paper Company has declared an extra dividend of 5 cents a share in addition to the quarterly disbursement of 30 cents, both payable December 15 to stockholders of record November 28. A similar extra was voted a year ago.

West Virginia to Pay Dividend

The West Virginia Pulp & Paper Company declared a dividend of 15 cents a share on the common stock, payable January 2 to stockholders of record December 15. Previous payment was 25 cents, made October 1.

Union Bag Earns $1,733,278

The year's low point in prices and sales for the entire paper industry was reflected in third quarter operations but an upturn has been in evidence in the fourth quarter, Alexander Calder, president of Union Bag and Paper Corporation, reported yesterday in his quarterly statement to sockholders. Union Bag's monthly net sales in the third quarter averaged $1,603,131. September net sales were $1,670,926 and October, first month of the last quarter, showed an increase to $2,572,255.

Net income of Union Bag and Paper Corporation for the third quarter amounted to $457,672 after provision for Federal income and excess profits taxes, equivalent to 36 cents a capital share. This compares with net income of $67,470, or 48 cents a share, in the September, 1941, quarter and $421,796, or 33 cents a share, in the June, 1942, quarter.

For twelve months ended September 30, 1942, net income was $1,733,278, or $1.37 a share, against net income of $1,932,809, or $1.52 a share, for the previous twelve months.

Brown Co. to Pay Interest

The Brown Company, on December 1, will pay interest from June 1, 1940 to December 1, 1940, on general mortgage 5%, cumulative bonds series A. Checks will be mailed to persons who are registered owners at the close of business November 30. Holders of old Brown Co. bonds which have not yet been exchanged under plan of reorganization consummated Nov. 29, 1941, will receive interest payments only upon exchange.

Great Northern Loses

The Great Northern Paper Company and wholly owned subsidiaries for the nine months to September 30, reports net profit, after $904,153 provision for Federal income taxes based on the Revenue Act of 1942, was $1,359,343, equal to $1.36 a share. This compares with $1,878,136 or $1.88 a share last year, when Federal tax provision was $1,060,000.

Kimberly-Clark Votes Dividend

The Kimberly-Clark Corporation has declared an extra dividend of 50 cents a share on the common stock, payable December 23 to stockholders of record December 11. In addition the quarterly distribution of 25 cents was made, payable January 1 to stockholders of record December 11. An extra of $1.25 was voted a year ago.

Great Lakes Co. Votes Dividend

The Great Lakes Paper Company, Ltd., has declared an interim dividend of 75 cents on Class "A" and "B" shares, payable December 31, to shareholders of December 21. The previous dividend was 25 cents, paid October 1, but 75 cents was paid December 31, 1941.

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5,000 must be specifically approved by the War Productions Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Memphis, Tenn.—Sefton Fibre Can Company, 3275 Big Bend road, St. Louis, Mo., manufacturer of fiber cans and containers, will carry out expansion and improvements in industrial building at 208 West Georgia street, Memphis, for new branch plant, with installation of equipment for large capacity. Also, will build addition. A building permit has been secured for work, reported to cost over $100,000, including equipment, and program will be carried out at early date. It is proposed to carry out further expansion at same location in the future.

Savannah, Ga.—The Rathborne, Hair & Ridgway Company, 1440 West 21st place, Chicago, Ill., manufacturer of corrugated paper boxes and other containers, has begun work on new one-story building on Louisville road, near Magazine street, Savannah, previously referred to in these columns, for new factory branch, storage and distributing plant. Cost reported close to $25,000, with equipment.

Chicago, Ill.—The Royal Continental Box Company, 908 North Leavitt street, manufacturer of paper boxes and containers, has taken out a permit for addition to plant. General contract for erection has been awarded to Valentine Construction Company, 3531 North Neva street, and work will proceed at once. Adolph Woerner, 3166 Lincoln avenue, is architect.

Chicago, Ill.—The American Label Company, 512 South Peoria street, manufacturer of labels, tags and kindred paper products, has arranged for purchase of one-story industrial building at 972 West Montana street, on site about 112 x 113 feet, for a stated consideration of $33,000. It is proposed to use property for company occupancy in future, expanding present production facilities. Building at present is under lease to another industrial company.

Camden, N. J.—Louis Bantivoglio, Liberty street and Delaware River, waste paper, is considering rebuilding of storage and distributing building, recently destroyed by fire. An official estimate of loss has not been announced.

New Companies

Mount Vernon, N. Y.—Perfection Products, Inc., has been chartered with capital of $20,000, to deal in paper goods of various kinds. Company is represented by Abraham Braslow, 1 Fourth avenue, Mount Vernon, attorney.

Irvington, N. J.—The Fibre Processing Corporation has been organized with capital of 100 shares of stock, no par value, to manufacture fiber products. New company is represented by Ernest P. Biro, 1007 Springfield avenue, Irvington, attorney.

New York, N. Y.—The Return Flap Envelope Corporation has been chartered to manufacture and deal in envelopes, cartons, etc. New company is represented by Emanuel Schwartz, 110 East Forty-second street, New York, attorney.

Dover, Del.—The Label Manufacturers' Association, Inc., care of Registrar & Transfer Company, Dover, representative, has been chartered under Delaware laws, without capital stock, as an organization of paper label manufacturers.

J. L. Brouwer Made Lieutenant

John L. Brouwer, vice-president of the Gibbs Brouwer Company, Inc., well-known paper and pulp mill machinery dealers and paper mill brokers, has been advanced to the rank of Lieutenant, Junior

JOHN L. BROUWER

Grade in the United States Naval Reserve. Mr. Brouwer has been second in command of a submarine chaser based on Key West, Florida, since he received his commission as an Ensign. He entered the Service a year ago.

Form Transportation Clubs

APPLETON, Wis., November 23, 1942.—War transportation committees have been organized by several paper mills to help form and coordinate automobile clubs for the transportation of workers when gasoline rationing goes into effect in the middle west. Management representatives at Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., are L. J. Barrette and Earl Rember; labor, Leslie Wipperman and Ollie Prusynski. At Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis.; Management, F. H. Rosebush and Henry Fredlund, labor, Lawrence Gustin and Gerald Stone for the Nekoosa mill, and Ervin Hofschild and Herman Osberg for the Port Edwards mill. Ahdawagam Paper Products Company; management, George Sawyer and M. O. Lipke; labor, Ray Hanneman and Conrad Booth.

Open Paper Bids for Six Months' Supply For Government Printing Office

WASHINGTON, D. C., Nov. 23—Paper bids were received today by the Joint Congressional Committee on Printing from 65 bidders for approximately 115,545,000 pounds of paper for the use of the Government Printing Office for the six months period beginning January next. Bids were received on restricted quantities. The Joint Committee will meet on November 30 to consider awards.

Newsprint

No. 1—5,000,000 lbs., 24x36—64; rolls, 19, 24, 36 and 48 ins. wide (3-inch fiber cores, weight of cores and wrappers shall be included in net weight).

Great Northern Paper Co.		(Ceiling Price)
Old Dominion Paper Co.		
	(400,000 lbs.)	2.74c
Marquette Paper Co.		2.50c

Telephone Book News

No. 2—1,500,000 lbs., 24x36—45; rolls, 28 and 38 ins. wide (3-inch fiber cores). (Weight of cores and wrappers shall be included in the net weight.)

Cauthorne Paper Co.		4.68c
St. Regis Paper Co.		5.445c
Walker-Goulard Plehn Co.		
	(500,000 lbs.)	4.35c
	(1,000,000 lbs.)	4.45c
R. P. Andrews Paper Co.		
	(750,000 lbs.)	4.812c
Bulkley Dunton & Co.		
	(300,000 lbs. per month max.)	5.15c
Graham Paper Co.		
	(300,000 lbs. per mo. max.)	4.863c
Lamy Paper Co.	(450,000 lbs.)	4.863c

Machine-Finish Book

No. 3—600,000 lbs., 25x38—70; flat, cut 22½x31, and 31¼x45½ ins.

R. P. Andrews Paper Co.		7.37c
Marquette Paper Co.		6.54c
Stanford Paper Co.		7.16c
Graham Paper Co.		7.62c
Butler Co.	(200,000 lbs.)	6.47c
	(200,000 lbs.)	6.72c

No. 4—1,000,000 lbs., 25x38—70; flat, cut 24x38, and 38x48 ins.

Whitaker Paper Co.		7.04c
Barton, Duer & Koch Paper Co.		7.14c
R. P. Andrews Paper Co.		7.39c
Marquette Paper Co.		6.44c
Stanford Paper Co.		7.19c
Graham Paper Co.		7.62c
Butler Co.	(200,000 lbs.)	6.47c
	(200,000 lbs.)	6.72c

No. 5—1,000,000 lbs., 25x38—70; flat, cut 24x38, and 38x48 ins.

Whitaker Paper Co.		7.17c
Mudge Paper Co.		6.99c
Barton, Duer & Koch Paper Co.		7.14c
R. P. Andrews Paper Co.		7.41c
Marquette Paper Co.		6.44c
Stanford Paper Co.		7.19c
Graham Paper Co.		7.40c
Butler Co.	(200,000 lbs.)	6.47c
	(200,000 lbs.)	6.72c

No. 6—600,000 lbs., 25x38—70; rolls, 28½ ins. wide (3-inch fiber cores).

Whitaker Paper Co.		6.90c
Mudge Paper Co.		6.63c
R. P. Andrews Paper Co.		6.98c
Bulkley Dunton & Co.		
	(200,000 lbs.)	5.86c
	(200,000 lbs.)	6.11c
Marquette Paper Co.		5.82c
Graham Paper Co.		6.65c

No. 7—1,000,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).

Whitaker Paper Co.		6.87c
Paper Corp. of U. S.		6.36c
Barton, Duer & Koch Paper Co.		6.89c
Frank Parsons Paper Co.		6.582c
R. P. Andrews Paper Co.		6.98c
Bulkley Dunton & Co.		
	(200,000 lbs.)	5.86c
	(200,000 lbs.)	6.11c
Marquette Paper Corp.		7.26c
Perkins-Goodwin Co.		
	(500,000 lbs.)	6.62c
Central Ohio Paper Co.		5.82c

No. 8—1,000,000 lbs., 25x38—70; rolls 19 and 38 ins. wide (3-inch fiber cores).

Whitaker Paper Co.		6.87c
Paper Corp. of U. S.		6.36c
Barton, Duer & Koch Paper Co.		6.89c
Frank Parsons Paper Co.		6.582c
R. P. Andrews Paper Co.		6.98c
Bulkley Dunton & Co.		
	(200,000 lbs.)	5.86c
	(200,000 lbs.)	6.11c
Marquette Paper Corp.		7.26c
Perkins-Goodwin Co.		
	(500,000 lbs.)	6.62c
Central Ohio Paper Co.		5.82c

No. 9—700,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores).

Whitaker Paper Co.		6.90c
Paper Corp. of U. S.		6.36c
Barton, Duer & Koch Paper Co.		6.89c
R. P. Andrews Paper Co.		6.98c
Bulkley Dunton & Co.		
	(200,000 lbs.)	5.86c
	(200,000 lbs.)	6.11c
Marquette Paper Corp.		7.26c
Central Ohio Paper Co.		5.82c

No. 10—600,000 lbs. 25x38—100; flat, cut 38x48 and 41x52 ins.

Whitaker Paper Co.		6.65c
Bermingham & Prosser Co.		
	(300,000 lbs.)	6.08c
Mead Sales Co., Inc.	(200 000 lbs.)	6.702c
Barton, Duer & Koch Paper Co.		6.83c
R. P. Andrews Paper Co.		6.87c
Stanford Paper Co.		6.69c
Graham Paper Co.		6.94c
Butler Co.		
	(300,000 lbs. per mo. max.)	6.08c
Perkins-Goodwin Co.		6.62c
Central Ohio Paper Co.		5:93c

Machine-Finish Book End Paper

No. 18—150,000 lbs., for waste leaves; flat, cut 25x38—160; the grain to run the 38-inch way.

Whitaker Paper Co.		7.37c
Old Dominion Paper Co.		
	(50,000 lbs.)	7.748c
Paper Corp. of U. S.		7.85c
R. P. Andrews Paper Co.		7.59c
Bulkley Dunton & Co.		7.21c
Marquette Paper Co.		7.13c
Stanford Paper Co.		8.00c
Central Ohio Paper Co.		6.64c

Offset Book

No. 19—4,000,000 lbs., 25x38—80; flat, cut 38x48 ins.

Frank Parsons Paper Co.		
	(2,000,000 lbs.)	7.894c
	(2,000,000 lbs.)	8.036c
Whitaker Paper Co.		
	(1,000,000 lbs.)	7.55c
	(2,000,000 lbs.)	7.59c
	(1,000 000 lbs.)	7.70c
Mudge Paper Co.	(1,000,000 lbs.)	7.91c
D. L. Ward Co.	(600,000 lbs.)	6.00c
Bermingham & Prosser Co.		
	(200,000 lbs.)	7.23c
	(200,000 lbs.)	7.48c
Paper Corp. of U. S.		7.87c
R. P. Andrews Paper Co.		
	(1,500,000 lbs.)	7.51c
Marquette Paper Corp.		
	(2,500,000 lbs.)	7.34c
	(6,000,000 lbs. max. for various classes)	7.46c
	(1,300 000 lbs. max. for various classes)	8.15c
Butler Co.	(200,000 lbs.)	7.23c
	(200,000 lbs.)	7.48c
Central Ohio Paper Co.		
	(500,000 lbs.)	6.92c

No. 20—40,000 lbs., 25x38—90; flat, cut 34x44 ins.

Whitaker Paper Co.		7.80c
Mudge Paper Co.		7.59c
Paper Corp. of U. S.		7.95c
Bulkley Dunton & Co.		7.23c
Marquette Paper Corp.		7.29c
Graham Paper Co.		7.75c
Aetna Paper Co.		6.87c

No. 21—3,000,000 lbs., 25x38—100 and 120; flat, cut 38x48 ins., grain as ordered.

Whitaker Paper Co.		
	(1,000,000 lbs.)	7.14c
Mudge Paper Co.		7.22c
D. L. Ward Co.	(100,000 lbs.)	7.30c
Chatfield Paper Corp.		
	(200,000 lbs.)	7.30c
Paper Corp. of U. S.		7.29c
Chatfield & Woods Co. of Pa.		
	(100,000 lbs.)	7.30c
R. P. Andrews Paper Co.		
	(1,000,000 lbs.)	7.07c
Bulkley & Dunton & Co.		
	(1,500,000 lbs.)	6.68c
	(400,000 lbs.)	6.93c
	(500,000 lbs.)	7.77c
Marquette Paper Corp.		
	(1,000,000 lbs.)	7.09c
	(200,000 lbs.)	7.30c
	(Max. of 1,300,000 for various classes)	7.54c
Graham Paper Co.	(200,000 lbs.)	7.30c
Butler Co.	(200,000 lbs.)	7.30c
Aetna Paper Co.	(500,000 lbs.)	6.87c
Central Ohio Paper Co.		
	(200,000 lbs.)	7.30c

No. 22—200,000 lbs., 25x38—100; flat, cut 38x50 ins.

Walker Goulard Plehn Co.		6.45c
Barton, Duer & Koch Paper Co.		7.08c
Whitaker Paper Co.		7.09c
Cauthorne Paper Co.		6.67c
Mudge Paper Co.		6.85c
D. L. Ward Co.		6.25c
Paper Corp. of U. S.		6.63c
R. P. Andrews Paper Co.		6.79c
Marquette Paper Corp.		6.65c
Stanford Paper Co.		6.83c
Central Ohio Paper Co.		6.46c

Lightweight Machine Finish Book

No. 23—60,000 lbs., 25x38—60; flat, cut 38x48 ins.

Walker Goulard Plehn Co.		7.48c
Paper Corp. of U. S.		8.13c
Marquette Paper Co.		7.42c
Graham Paper Co.		7.68c

50 Per Cent Lightweight Machine-Finish Book

No. 24—100,000 lbs., 25x38—60; flat, cut 38x48 ins. Min. order 10,000 lbs.

Old Dominion Paper Co.		15.17c
Bermingham & Prosser Co.		15.95c
Paper Corp. of U. S.		14.97c

50 Per cent Antique Book

No. 26—200,000 lbs., 25x38—80; flat, cut 38x48 ins.

Whitaker Paper Co.		11.66c

Built For *Longer* Service

the new *Improved* PORTER Side Entering Agitator

The new improved side-entering agitator built by H. K. Porter Company, Inc., is constructed to give thorough agitation and long service for the process industries.

In order to resist action by corrosive liquids the parts operating inside the agitated vessel can be supplied in any metal or alloy.

The Porter side-entering agitator is particularly applicable in vessels where vertical agitation is either undesirable or impractical. Standard units can be furnished to employ either belt or motor drive in sizes ranging upward from ½ H.P.

Write for Bulletin SE-100 which gives complete details about this Porter Side Entering Agitator.

H. K. PORTER COMPANY, INC.

PITTSBURGH PENNSYLVANIA

Cauthorne Paper Co.	11.67c
Old Dominion Paper Co.	11.48c
Bermingham & Prosser Co.	11.61c
Paper Corp. of U. S.	11.64c
Butler Co. (500,000 lbs)	12.49c
(100,000 lbs.)	12.90c
Perkins Goodwin Co.	12.88c
Aetna Paper Co.	10.97c

No. 27—80,000 lbs., 25x38—80; flat, cut 22¾x31½ ins.

Whitaker Paper Co.	11.59c
Cauthorne Paper Co.	11.67c
Old Dominion Paper Co.	11.48c
Bermingham & Prosser Co.	11.61c
Paper Corp. of U. S.	11.64c
Butler Co.	12.49c
Aetna Paper Co.	10.97c

75 Per Cent Laid Antique Book

No. 29—30,000 lbs., 25x38—140; flat, cut 24x38 ins.; the laid marks to run the 24-inch direction of the sheet; the grain and chain marks to run lengthwise of the sheet.

Chatfield & Woods Co. of Pa.	17.50c
Barton, Duer & Koch Paper Co.	15.75c
Whitaker Paper Co.	15.84c
Cauthorne Paper Co.	15.30c
D. L. Ward Co.	17.50c
Chatfield Paper Corp.	17.00c
Paper Corp. of U. S.	14.73c
R. P. Andrews Paper Co.	15.77c
Stanford Paper Co.	17.00c
Graham Paper Co.	17.00c
Butler Co.	16.00c
Aetna Paper Co.	14.73c
Central Ohio Paper Co.	17.00c

Supercalendered Book

No. 33—1,500,000 lbs., 25x38—90; flat, cut 31¼x45½, and 39x50 ins.

Mudge Paper Co.	6.72c
R. P. Andrews Paper Co.	6.53c
Marquette Paper Co.	6.33c
Stanford Paper Co. (400,000 lbs.)	7.24c
Butler Co. (200,000 lbs.)	6.48c

No. 34—200,000 lbs., 25x38—100; flat, cut 38x48 ins.

Walker Goulard Plehn Co.	6.48c
Mudge Paper Co.	7.05c
R. P. Andrews Paper Co.	7.06c
Marquette Paper Corp.	6.21c
Stanford Paper Co.	6.99c

No. 35—3,000,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

Frank Parsons Paper Co. (1,500,000 lbs.)	6.771c
Mudge Paper Co. (1,000,000 lbs.)	6.24c
Paper Corp. of U. S. (1,000,000 lbs.)	6.18c
R. P. Andrews Paper Co.	6.33c
Graham Paper Co.	5.98c

Machine-Coated Book

No. 37—500,000 lbs., 25x38—90; flat, cut 35x45, 38x48, and 39x50 ins.

Barton, Duer & Koch Paper Co.	6.05c

No. 38—1,000,000 lbs. 25x38—100 and 120; flat, cut 35x45, 38x48, and 39x50 ins.

Mead Sales Co. Inc. (300,000 lbs.)	6.183c
Barton, Duer & Koch Paper Co.	5.00c

No. 39—200,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

Barton, Duer & Koch Paper Co.	5.85c

No. 40—100,000 lbs., 25x38—100 and 120; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

Mead Sales Co., Inc.	5.833c
Barton, Duer & Koch Paper Co.	4.65c

Coated Book

No. 41—1,000,000 lbs., 25x38—140 and 160; flat, cut 38x48, and 39x50 ins.; the grain to run lengthwise of the sheet.

Whitaker Paper Co.	8.83c
Old Dominion Paper Co. (100,000 lbs.)	8.187c
Bermingham & Prosser Co. (125,000 lbs.)	6.93c
(125,000 lbs.)	7.18c
(125,000 lbs.)	7.42c
(125,000 lbs.)	7.68c
Paper Corp. of U. S.	8.25c
Kennelly Paper Co.	7.25c
	6.75c
Walker Goulard Plehn Co. (500,000 lbs. each)	6.93c
(500,000 lbs. each)	7.18c
(500,000 lbs. each)	7.43c
(500,000 lbs. each)	7.68c
John F. Post, Inc. (500 000 lbs.)	9.06c
Marquette Paper Co.	7.64c
	7.39c
Stanford Paper Co.	8.42c
Lamy Paper Co.	6.93c
	7.18c
	7.43c
	7.68c
	8.19c
Perkins Goodwin Co.	
(500,000 lbs.)	7.97c
	8.37c

50 Per Cent Machine-Finish Lithograph

No. 43—80,000 lbs., 25x38—160; flat, cut 10½x16 ins., the grain to run lengthwise of the sheet.

Whitaker Paper Co.	11.99c
D. L. Ward Co.	12.50c
Old Dominion Paper Co.	11.73c
Chatfield Paper Corp.	12.50c
Paper Corp. of U. S.	11.72c
Walker Goulard Plehn Co.	11.35c
Chatfield & Woods Co. of Pa.	12.50c
Barton, Duer & Koch Paper Co.	14.80c
R. P. Andrews Paper Co.	11.77c
Stanford Paper Co.	12.50c
Graham Paper Co.	12.50c
Butler Co.	12.312c
Aetna Paper Co.	11.74c
Central Ohio Paper Co.	12.50c

Ground Wood Mimeograph

No. 44—4,000,000 lbs., No. 36; flat, cut 32½x42½, and 38x48½ ins., grain as ordered.

Whitaker Paper Co. (3,000,000 lbs.)	4.74c
Bradner Smith & Co. (500,000 lbs.)	5.19c
Mudge Paper Co. (2,000 000 lbs.)	4.75c
D. L. Ward Co. (1,000,000 lbs.)	4.74c
(1,000,000 lbs.)	4.89c
Old Dominion Paper Co.	4.6238c
St. Regis Paper Co.	5.15c
Walker Goulard Plehn Co. (1,000,000 lbs.)	4.75c
(1,000,000 lbs.)	4.90c
Mead Sales Co., Inc.	4.75c
Barton, Duer & Koch Paper Co.	4.95c
R. P. Andrews Paper Co. (1,000,000 lbs.)	5.113c
Bulkley Dunton & Co. (1,000,000 lbs.)	4.80c
Marquette Paper Corp.	4.73c
Graham Paper Co. (1,000,000 lbs.)	5.19c
Lamy Paper Co. (1,000,000 lbs.)	5.19c
Butler Co. (500,000 lbs.)	5.19c

Chemical Wood Mimeograph, White and Colored

No. 45—200,000 lbs., white, Nos. 36 and 40; flat, cut 32½x42½, and 38 x48½ ins.; the grain to run as ordered.

Whitaker Paper Co.	6.70c
Cauthorne Paper Co.	6.47c
Walker Goulard Plehn Co.	6.01c
Barton, Duer & Koch Paper Co.	6.68c
Eastern Corp.	6.97c
Central Ohio Paper Co.	6.39c

No. 46—300,000 lbs., blue, buff, green, pink and yellow, Nos. 36 and 40; flat, cut 32½x42½ and 38x48½ ins.; the grain to run as ordered. Min. order, one color, 10,000 lbs.

Cauthorne Paper Co.	6.97c
Eastern Corp.	7.72c
Bulkley Dunton & Co.	6.51c
Central Ohio Paper Co.	6.87c

25 Per Cent Mimeograph

No. 48—500,000 lbs., Nos. 36, 40 and 48; flat, cut 32½x42½, 34½x44, and 38x48½ ins.; the grain to run as ordered.

Whitaker Paper Co.	10.44c
Mudge Paper Co. (250,000 lbs.)	11.00c
D. L. Ward Co. (200,000 lbs.)	11.00c
Old Dominion Paper Co.	8.33c
Chatfield Paper Corp. (200,000 lbs.)	11.00c
Walker Goulard Plehn Co. (100,000 lbs.)	10.25c
Chatfield & Woods Co. of Pa. (200,000 lbs.)	11.00c
Barton, Duer & Koch Paper Co. (100,000 lbs.)	10.07c
Willcox, Walter Furlong Paper Co. (200,000 lbs.)	9.17c
R. P. Andrews Paper Co. (300,000 lbs.)	9.17c
Bulkley Dunton & Co.	8.94c
Stanford Paper Co. (200,000 lbs.)	11.00c
Virginia Paper Co.	9.00c
Graham Paper Co. (50,000 lbs.)	9.87c
(200,000 lbs.)	10.96c
Butler Co. (50,000 lbs.)	9.90c
(200,000 lbs.)	11.00c
Aetna Paper Corp.	7.97c
Central Ohio Paper Co. (200,000 lbs.)	11.00c

Blue U S M O Safety Writing

No. 51—600,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

D. L. Ward Co. (300,000 lbs.)	11.91c
R. P. Andrews Paper Co.	11.93c

U S M O Writing, White and Blue

No. 52—6,000 lbs., No. 32; rolls, 8½ inches wide, 24 ins. in diameter (3-inch fiber cores). Min. order, either color, 2,000 lbs.

R. P. Andrews Paper Co.	11.50c
	12.00c

Chemical Wood Writing, White and Colored

No. 55—7,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

Whitaker Paper Co. (3,000,000 lbs.)	6.77c
Cauthorne Paper Co. (600,000 lbs.)	6.99c
Mudge Paper Co.	6.25c
D. L. Ward Co. (1,000,000 lbs.)	6.99c
Resolute Paper Products Co.	6.2344c
Baxter Paper Co. (600,000 lbs.)	6.99c
Barton, Duer & Koch Paper Co. (1,000,000 lbs.)	6.93c
Frank Parsons Paper Co. (1,000,000 lbs.)	6.951c
Eastern Corp.	6.97c
R. P. Andrews Paper Co. (1,000,000 lbs.)	6.87c
North American Pulp & Paper Co. (200,000 lbs.)	7.15c
Marquette Paper Corp. (6,000,000 lbs. max. on several classes)	7.47c
(1,300,000 lbs. max. on several classes)	8.37c
Perkins Goodwin Co. (400,000 lbs.)	6.84c
Central Ohio Paper Co. (500,000 lbs.)	6.91c

No. 56—15,000,000 lbs., white No. 40; flat, cut any size, min. width 21 ins., max. width 42 ins.

Whitaker Paper Co. (4,000,000 lbs.)	6.77c
Mudge Paper Co.	6.25c
D. L. Ward Co. (3,000,000 lbs.)	6.86c
(1,000,000 lbs.)	6.93c
(200,000 lbs.)	7.14c
Resolute Paper Products	6.2344c
Boston Paper Board Co. (800,000 lbs.)	6.80c
Walker Goulard Plehn Co. (200,000 lbs.)	7.20c
Mead Sales Co., Inc. (560,000 lbs.)	6.991c
Barton, Duer & Koch Paper Co. (1,000,000 lbs.)	6.83c
Frank Parsons Paper Co. (1,000,000 lbs.)	6.951c
Eastern Corp.	6.97c
R. P. Andrews Paper Co. (4,000,000 lbs.)	6.74c

A REPUTATION IS A LIVING THING

Quality, as a matter of refinements steadily
bred into a product and sensitively cultivated.
General's policy is guided by faithful adherence to fun-
damentals through fluctuating conditions.
Current an attitude of perennial responsibility toward
all those who deal with us.
Thus is how a business becomes planted deeper and
deeper in its field of operations.
Thus is how our business grows and flourishes and
our symbol becomes synonymous with Quality.

GENERAL DYESTUFF CORPORATION · NEW YORK

Nine 14' x 40' Horizontal Biggs Digesters

Left—Installation of nine 14' x 40' Horizontal Digesters at the plant of the Consolidated Water Power and Paper Company, Appleton, Wisc. These Digesters have been giving satisfactory service for many years.

Biggs Welded Rotary Digesters

Left—BIGGS All welded Rotary Digesters for Chestnut chip and similar processes. Units may be lined with Monel or similar metals, tile, etc.

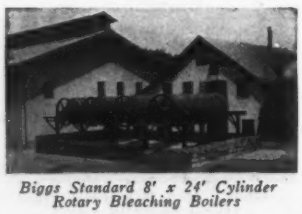
18' Dia. Riveted Rotary Digesters

Biggs Digesters

Since 1887 BIGGS have been serving the Paper Industry throughout the world.

BIGGS Globe, Cylinder and Stationary Digesters are furnished in all sizes and are complete with various types of drives, linings, etc., to meet operating conditions encountered.

The established record of BIGGS all-welded Digesters and pressure vessels — a record of 100% performance — is conclusive evidence of BIGGS continued leadership in the Paper Industry.



Biggs Standard 8' x 24' Cylinder Rotary Bleaching Boilers

Rotary Tumbling Digesters

BUILT BY BIGGS

Globe Rotary Bleaching Boilers: Sulphate and Sulphite Digesters: Cylinder Rotary Boilers: Penstocks: Electric Welded Steel and Iron Pipe for Water and Mill Supply: Welded High Pressure Vessels: Special Steel and Alloy Plate Work for the Paper Industry.

Competent Erecting Organization

THE BIGGS BOILER WORKS CO. Established 1887 AKRON, OHIO, U. S. A.

North American Pulp & Paper Co.
(200,000 lbs.) 7.25c
Bulkley Dunton & Co.
(1,000,000 lbs.) 6.81c
(360,000 lbs.) 7.02c
Marquette Paper Corp.
(6,000,000 lbs. max. on several classes) 7.47c
(1,300,000 lbs. max. on several classes) 7.47c
Perkins Goodwin Co.
(1,000,000 lbs.) 6.84c

No. 58—4,000,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

Whitaker Paper Co.
(1,000,000 lbs.) 6.45c
(1,000,000 lbs.) 6.57c
Mudge Paper Co. 6.00c
D. L. Ward Co. (2,250,000 lbs.) 6.39c
Resolute Paper Products Co. 5.985c
Walker Goulard Plehn Co.
(200,000 lbs.) 6.45c
Mead Sales Co., Inc.
(400,000 lbs.) 6.666c
Barton, Duer & Koch Paper Co.
(500,000 lbs.) 6.49c
Frank Parsons Paper Co.
(1,000,000 lbs.) 6.393c
Eastern Corp. 6.72c
R. P. Andrews Paper Co.
(1,000,000 lbs.) 6.43c
North American Pulp & Paper Co.
(4,000,000 lbs.) 6.50c
Bulkley Dunton & Co.
(4,000,000 lbs.) 6.46c
Marquette Paper Co.
(6,000,000 lbs. max. on several classes) 7.23c
(1,300,000 lbs. max. on several classes) 7.81c
Stanford Paper Co.
(2,000,000 lbs.) 6.39c
Butler Co. (1,000,000 lbs.) 6.13c
Perkins Goodwin Co.
(300,000 lbs.) 6.39c

No. 59—2,000,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

Whitaker Paper Co. 6.45c
Cauthorne Paper Co.
(500,000 lbs.) 6.39c
Mudge Paper Co. 6.00c
D. L. Ward Co. (1,000,000 lbs.) 6.39c
Resolute Paper Products Co. 5.985c
Walker Goulard Plehn Co.
(1,000,000 lbs.) 5.95c
(500,000 lbs.) 6.40c
Mead Sales Co., Inc.
(460,000 lbs.) 6.666c
Chatfield & Woods Co. of Pa.
(100,000 lbs.) 5.98c
Barton, Duer & Koch Paper Co.
(500,000 lbs.) 6.49c
Frank Parsons Paper Co.
(1,000,000 lbs.) 6.393c
Eastern Corp. 6.72c
R. P. Andrews Paper Co.
(1,000,000 lbs.) 6.43c
North American Pulp & Paper Co.
(400,000 lbs.) 6.75c
Marquette Paper Corp.
(600,000 lbs. max. on several classes) 7.23c
(1,300,000 lbs. max. on several classes) 7.12c
Stanford Paper Co.
(750,000 lbs.) 6.39c
Perkins Goodwin Co.
(200,000 lbs.) 6.19c
Central Ohio Paper Co.
(500,000 lbs.) 5.98c

No. 61—3,000,000 lbs., blue, buff, green, pink, salmon and yellow Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, 10,000 lbs.

Cauthorne Paper Co.
(600,000 lbs.) 7.96c
Mudge Paper Co. 7.00c
D. L. Ward Co. (200,000 lbs.) 7.24c
(200,000 lbs.) 7.39c
(1,000,000 lbs.) 7.69c
Old Dominion Paper Co.
(700,000 lbs.) 7.1638c
Walker Goulard Plehn Co.
(200,000 lbs.) 7.25c
(200,000 lbs.) 7.40c
(500,000 lbs.) 7.60c

No. 62—300,000 lbs., blue, buff, green, pink, salmon and yellow, Nos. 32 and 40; rolls, 32 and 38 ins. (3-inch fiber cores).

Cauthorne Paper Co. 7.74c
Mudge Paper Co. 6.75c
D. L. Ward Co. (4,000,000 lbs.) 6.79c
(150,000 lbs.) 7.19c
Walker Goulard Plehn Co. 6.74c
Mead Sales Co., Inc.
(150,00 lbs.) 7.76c
North American Pulp & Paper Co. 7.75c
Marquette Paper Co. (6,000,000 lbs. max on several classes) 7.89c
(1,300,000 lbs. max. on several classes) 7.62c

Lithograph-Finish Map

No. 64—50,000 lbs. Nos. 32 and 40 flat, cut any size. Min. width 22 ins. Maximum width 48 ins.

Whitaker Paper Co. 7.77c

50 Per Cent Lithograph-Finish Map

No. 65—1,000,000 lbs., Nos. 32, 40, 48 and 56; flat, cut any size, min. width 22 ins., max. width, 48 ins, the grain to run lengthwise of the sheet.

Cauthorne Paper Co.
(150,000 lbs.) 12.73c
D. L. Ward Co. (300,000 lbs.) 16.00c
Bermingham & Prosser Co.
(500,00 lbs.) 12.50c
(500,00 lbs.) 12.75c
Forest Paper Co., Inc.
(100,000 lbs.) 12.73c
R. P. Andrews Paper Co.
(100,000 lbs.) 13.57c
(100,000 lbs.) 14.51c
(360,000 lbs.) 15.95c
Bulkley Dunton & Co.
(200,000 lbs.) 12.50c
Virginia Paper Co. (100,000 lbs.) 13.22c
Stanford Paper Co. 12.44c
Collins Mfg. Co. (200,000 lbs.) 11.80c
(300,000 lbs.) 11.97c

75 Per Cent Lithograph-Finish Map

No. 66—300,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; ream markers to be omitted.

Mudge Paper Co. 14.88c
Paper Corp. of U. S. 16.50c
Walker Goulard Plehn Co.
(200,000 lbs.) 15.15c
Baxter Paper Co. (100,000 lbs.) 16.35c
(200,000 lbs.) 17.85c
Barton, Duer & Koch Paper Co. 15.85c
Stanford Paper Co. (100,000 lbs.) 16.50c
Graham Paper Co. (100,000 lbs.) 15.75c
(100,000 lbs.) 16.35c
(100,000 lbs.) 16.55c

No. 67—80,000 lbs., Nos. 48 and 56; flat, cut any size, min. width 30 ins., max. width 48 ins.; the grain to run lengthwise of the sheet. Min. order, one substance, 5,000 lbs.

Mudge Paper Co. 14.58c
Paper Corp. of U. S. 16.08c
Walker Goulard & Plehn Co. 15.15c
Stanford Paper Co. 16.50c
Graham Paper Co. 16.95c

100 Per Cent White Chart, Lithograph-Finish

No. 68—400,000 lbs., Nos. 83 and 96; flat, cut any size, min. width 22 ins., max. width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

D. L. Ward Co. (100,000 lbs.) 27.00c
Paper Corp. of U. S. 17.96c
Barton, Duer & Koch Paper Co. 19.35c
R. P. Andrews Paper Co. 22.97c
Stanford Paper Co. 23.50c

No 69—400,000 lbs., Nos. 83 and 96; flat, cut any size, min. width 22 ins., max. width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

Paper Corp. of U. S. 17.96c
Barton, Duer & Koch Paper Co. 19.35c
R. P. Andrews Paper Co. 22.97c
Stanford Paper Co. 23.50c

No. 70—400,000 lbs., Nos. 83 and 96; flat, cut any size, min. width 22 ins., max. width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

Paper Corp. of U. S. 17.96c
Barton, Duer & Koch Paper Co. 19.35c
R. P. Andrews Paper Co. 22.97c
Stanford Paper Co. 23.50c

Chemical Wood Manifold, White and Colored

No. 71—1,000,000 lbs., white, No. 18; flat, cut 21x32, and 32x42 ins.; the grain to run 21-inch and 42-inch ways.

Cauthorne Paper Co. 8.30c
Resolute Paper Products Co. 7.98c
Import Paper Co. 8.00c
Bermingham & Prosser Co.
(4,000,000 lbs.) 8.25c
(300,000 lbs.) 8.50c
(300,000 lbs.) 8.75c
Paper Corp. of U. S. (500,000 lbs.) 7.83c
(500,000 lbs.) 8.87c
Walker Goulard Plehn Co.
(400,000 lbs.) 8.50c
R. P. Andrews Paper Co. 8.70c
North American Pulp & Paper Co. 8.25c
Baldwin Paper Co., Inc.
(500,000 lbs.) 8.25c
Marquette Paper Co. (500,000 lbs.) 6.83c
(500,000 lbs.) 8.81c
Graham Paper Co. (1,000,000 lbs.) 7.95c
(500,000 lbs.) 8.10c
Butler Co.
(500,000 lbs.) 8.20c
Central Ohio Paper Co.
(500,000 lbs.) 8.88c

No. 72—100,000 lbs. white, No. 18 rolls, 24 ins. wide. (3-inch fiber cores).

Cauthorne Paper Co. 7.50c
Old Dominion Paper Co. 7.698c
Resolute Paper Products Co. 7.73c
Import Paper Co. 7.50c
Bermingham & Prosser Co. 7.74c
Paper Corp. of U. S. 7.52c
R. P. Andrews Paper Co. 8.40c
North American Pulp & Paper Co. 7.50c
Marquette Paper Co. 7.95c
Graham Paper Co. 7.45c
Butler Co. 7.70c
Central Ohio Paper Co. 8.97c

No. 73—400,000 lbs., blue, green, pink, and yellow, No. 18; flat, cut 21x 32, 22x34, 28x34 and 32x42 ins.; the grain to run the 21-inch and 42-inch ways. Min. order, on color 5,000 lbs.

Mudge Paper Co. 8.95c
Old Dominion Paper Co. 8.729c
Resolute Paper Products Co. 8.728c
Import Paper Co. 8.75c
Bermingham & Prosser Co.
(200,000 lbs.) 9.00c
(200,000 lbs.) 9.25c
Paper Corp. of U. S. (200,000 lbs.) 8.53c
(200,000 lbs.) 8.65c
North American Pulp & Paper Co. 8.75c
Baldwin Paper Co., Inc. 9.00c
Marquette Paper Co. 9.13c
Graham Paper Co. 8.70c
Butler Co. 9.42c
Central Ohio Paper Co. 10.39c

No. 75—300,000 lbs., white, No. 14; flat, cut 38x48 ins. Min. order, 5,000 lbs.

Marquette Paper Co. (150,000 lbs.) 19.75c
(150,000 lbs.) 21.75c

50 Per Cent Manifold, White and Colored

No. 76—800,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 28x34, and 32x42 ins.; the grain to run the 21-inch and 42-inch ways.

Whitaker Paper Co. (400,000 lbs.) 19.60c
Old Dominion Paper Co.
(50,000 lbs.) 16.983c
(100,000 lbs.) 17.734c
Paper Corp. of U. S. (300,000 lbs.) 18.96c
Walker Goulard Plehn Co. 18.30c
Barton, Duer & Koch Paper Co.
(400,000 lbs.) 18.00c
Chicago Paper Co. (100,000 lbs.) 19.35c
Stanford Paper Co. (200,000 lbs.) 18.32c
(200,000 lbs.) 18.89c
(100,000 lbs.) 19.32c
Graham Paper Co. (40,000 lbs.) 19.55c
Butler Co. (200,000 lbs.) 18.49c
(200,000 lbs.) 18.81c

No. 77—100,000 lbs., white, No. 18; rolls, 24 ins. wide. (3-inch fiber cores).

Whitaker Paper Co. 18.68c
Paper Corp. of U. S. 18.00c
Walker Goulard Plehn Co. 17.80c
Chicago Paper Co. 18.95c

No. 78—400,000 lbs., blue, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.

Whitaker Paper Co.	(100,000 lbs.)	20.87c
Old Dominion Paper Co.	(100,000 lbs.)	17.984c
	(100,000 lbs.)	18.479c
Bermingham & Prosser Co.	(200,000 lbs.)	19.36c
	(200,000 lbs.)	19.79c
Walker Goulard Plehn Co.		19.05c
Barton, Duer & Koch Paper Co.	(200,000 lbs.)	19.50c
	(100,000 lbs.)	20.25c
Whiting Paterson Co., Inc.	(100,000 lbs.)	20.79c

100 Per Cent White Manifold

No. 84—100,000 lbs., No. 18; flat, cut 32x42 ins.; the grain to run the 42-inch way. Min. order 5,000 lbs.

Old Dominion Paper Co.	28.549c
Paper Corp. of U. S.	26.92c
Barton, Duer & Koch Paper Co.	25.75c
R. P. Andrews Paper Co.	31.05c
Chicago Paper Co.	27.75c
Bulkley Dunton & Co.	26.95c

50 Per Cent White Glazed Manifold

No. 85—400,000 lbs., No. 16; flat, cut 28x34 ins.; the grain to run the 34-inch way. Min. order 20,000 lbs.

Barton, Duer & Koch Paper Co.	(200,000 lbs.)	19.35c
	(200,000 lbs.)	20.35c
R. P. Andrews Paper Co.	(200,000 lbs.)	20.34c
	(100,000 lbs.)	21.89c

Chemical Wood Bond, White and Colored

No. 101—600,000 lbs., white, No. 26; flat, cut 32x42 ins.

D. L. Ward Co.	(300,000 lbs.)	8.13c
Barton, Duer & Koch Paper Co.		7.96c
Eastern Corp.		8.58c
North American Pulp & Paper Co.	(200,000 lbs.)	9.60c
Stanford Paper Co.		7.99c

No. 102—2,000,000 lbs., No. 40; flat, cut any size, min. width 21 ins.; max. width 37 ins.

Whitaker Paper Co.	(600,000 lbs.)	7.25c
D. L. Ward Co.	(1,000,000 lbs.)	6.93c
	(1,000,000 lbs.)	6.99c
Eastern Corp.		6.97c
R. P. Andrews Paper Co.	(1,000,000 lbs.)	7.23c
Marquette Paper Co.	(6,000,000 lbs. max. on several classes)	7.46c
	(1,300,000 lbs. max. on several classes)	7.71c
Central Ohio Paper Co.	(300,000 lbs.)	7.24c

No. 103—300,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 38 ins. Min. order, one color, 5,000 lbs.

D. L. Ward Co.	8.88c
Eastern Corp.	7.72c
Aetna Paper Co.	8.23c

25 Per Cent Bond, White and Colored

No. 105—600,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 34 ins.

Whitaker Paper Co.		14.14c
Bradner Smith & Co.	(300,000 lbs.)	14.52c
Mudge Paper Co.	(200,000 lbs.)	14.51c
	(100,000 lbs.)	14.81c
Baxter Paper Co.	(100,000 lbs.)	15.65c
Barton, Duer & Koch Paper Co.	(240,000 lbs.)	16.23c
Willcox Walter Furlong Paper Co.	(100,000 lbs.)	14.45c
Aetna Paper Co.		13.22c

No. 106—2,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 34 ins.

Whitaker Paper Co.	(1,000,000 lbs.)	11.98c
Carpenter Paper Co.	(150,000 lbs.)	12.63c
	(150,000 lbs.)	12.94c
Forest Paper Co., Inc.	(300,000 lbs.)	11.27c
R. P. Andrews Paper Co.	(100,000 lbs.)	12.97c
Bulkley Dunton & Co.	(200,000 lbs.)	11.27c
Virginia Paper Co.	(100,000 lbs.)	13.11c
Millcraft Paper Co.	(100,000 lbs.)	13.27c
Butler Co.	(500,000 lbs.)	11.59c
	(300,000 lbs.)	11.77c
	(200,000 lbs.)	11.98c
Aetna Paper Co.	(500,000 lbs.)	10.93c
	(1,000,000 lbs.)	11.99c
Tobey Fine Paper, Inc.	(100,000 lbs.)	11.90c
	(50,000 lbs.)	12.40c

No. 107—6,000,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Whitaker Paper Co.	(2,000,000 lbs.)	11.71c
Bradner Smith & Co.	(200,000 lbs.)	12.29c
Cauthorne Paper Co.	(200,000 lbs.)	11.97c
	(250,000 lbs.)	11.50c
Paper Corp. of U. S.	(250,000 lbs.)	11.49c
	(250,000 lbs.)	12.09c
Walker Goulard Plehn Co.	(400,000 lbs.)	12.49c
Quaker City Paper Co.	(100,000 lbs.)	11.07c
Baxter Paper Co.	(100,000 lbs.)	12.95c
Whiting Paterson Co., Inc.	(300,000 lbs.)	11.07c
Merriam Paper Co.	(200,000 lbs.)	11.09c
Willcox, Waler Furlong Paper Co.	(200,000 lbs.)	11.07c
Whitehead & Alliger Co.	(300,000 lbs.)	11.07c
Baldwin Paper Co., Inc.	(250,000 lbs.)	11.50c
Bulkley Dunton & Co.	(100,000 lbs.)	11.07c
	(1,000,000 lbs.)	11.25c
Stanford Paper Co.	(100,000 lbs.)	12.35c
Collins Mfg. Co.	(750,000 lbs.)	9.89c
	(750,000 lbs.)	10.25c
	(750,000 lbs.)	10.60c
Butler Co.	(500,000 lbs.)	11.39c
	(300,000 lbs.)	11.64c
	(200,000 lbs.)	11.87c
Aetna Paper Co.	(1,000,000 lbs.)	10.71c
	(500,000 lbs.)	11.89c
Central Ohio Paper Co.	(350,000 lbs.)	11.90c
	(100,000 lbs.)	12.40c

No. 108—4,000,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.

Whitaker Paper Co.	(500,000 lbs.)	11.71c
Chatfield Paper Co.	(100,000 lbs.)	12.58c
Bermingham & Prosser Co.	(800,00 lbs.)	11.25c
Chatfield & Woods Co. of Pa.	(100,000 lbs.)	12.58c
Barton, Duer & Koch Paper Co.	(200,000 lbs.)	11.07c
Collins Mfg. Co.	(750,000 lbs.)	9.89c
	(750,000 lbs.)	10.25c
	(250,000 lbs.)	10.60c
Aetna Paper Co.	(2,000,000 lbs.)	10.71c
	(500,000 lbs.)	11.89c

No. 109—100,000 lbs., white, No. 26; rolls, 34 ins. wide. (3-inch fiber cores.)

Nashua Gummed & Coated Paper Co.		14.30c
Willcox, Walter Fulrong Paper Co.	(200,000 lbs.)	13.95c
Chicago Paper Co.		15.65c
Aetna Paper Co.		12.97c

No. 110—100,000 lbs., yellow, No. 26; flat, cut 34x44 ins. Min. order 5,000 lbs.

Whitaker Paper Co.	14.76c
R. P. Andrews Paper Co.	15.87c
Swigart Paper Co.	14.95c
Aetna Paper Co.	13.72c

No. 111—1,200,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 35 ins.

Whitaker Paper Co.	(200,000 lbs.)	12.15c
	(500,000 lbs.)	13.79c
Bradner Smith & Co.	(150,000 lbs.)	13.62c
Carpenter Paper Co.	(200,000 lbs.)	12.26c
Forest Paper Co.	(100,000 lbs.)	13.45c
Merriam Paper Co.	(50,000 lbs.)	13.49c
Stanford Paper Co.	(100,000 lbs.)	12.27c
Aetna Paper Co.	(500,000 lbs.)	10.99c
	(700,000 lbs.)	11.99c

No. 112—1,400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins.

Whitaker Paper Co.	(500,000 lbs.)	13.48c
E. E. Lloyd Paper Co.	(200,000 lbs.)	11.82c
Messinger Paper Co.		11.82c
Resolute Paper Products Co.	(100,000 lbs.)	12.85c
Walker Goulard Plehn Co.	(400,000 lbs.)	12.73c
Whiting Paterson Paper Co.	(50,000 lbs.)	13.71c
McIntosh Paper Co.	(100,000 lbs.)	11.82c
Collins Mfg. Co.	(200,000 lbs.)	10.10c
	(400,000 lbs.)	10.25c
	(40,000 lbs.)	10.74c
	(300,000 lbs.)	10.97c
	(200,000 lbs.)	12.14c
	(200,000 lbs.)	12.34c
Aetna Paper Co.	(500,000 lbs.)	10.89c
	(900,000 lbs.)	11.89c

50 Per Cent Bond, White and Colored

No. 120—20,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 34 ins.

Chatfield & Woods Co. of Pa.	17.00c
Barton, Duer & Koch Co.	15.90c
Aetna Paper Co.	15.97c

No. 121—40,000 lbs., white, Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 35 ins.

Bradner Smith & Co.	14.14c
Chatfield Paper Co.	13.90c
Chatfield & Woods Co. of Pa.	13.75c
Aetna Paper Co.	12.24c

No. 122—20,000 lbs., white, No. 32; rolls, 24 and 32 ins. wide. (3-inch fiber cores.)

Chatfield & Woods Co. of Pa.	13.55c
Aetna Paper Co.	12.24c

No. 123—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 34 ins. Min. order, one color, one substance, 2,500 lbs.

Walker Goulard Plehn Co.	15.79c
Collins Mfg. Co.	13.49c
Aetna Paper Co.	14.41c

75 Per Cent White Bond

No. 125—2,000 lbs., No. 26; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order, 2,000 lbs.

Old Dominion Paper Co.	21.98c
Paper Corp. of U. S.	20.00c
Walker Goulard Plehn Co.	24.54c
Stanford Paper Co.	23.20c

No. 126—2,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 21 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.

Old Dominion Paper Co.	18.48c
Paper Corp. of U. S.	20.00c
Walker Goulard Plehn	19.89c
Stanford Paper Co.	19.60c

100 Per Cent White Bond

No. 128—40,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.

Whitaker Paper Co.	24.50c
Carpenter Paper Co.	26.14c
Old Dominion Paper Co.	20.479c
Paper Corp. of U. S.	19.45c
Garrett-Buchanan Co.	24.50c
Walker Goulard Plehn Co.	21.47c
Chatfield & Woods Co. of Pa.	23.25c
Barton, Duer & Koch Paper Co.	20.85c
R. P. Andrews Paper Co.	24.33c
Stanford Paper Co.	24.50c
Graham Paper Co.	24.27c
Butler Co.	22.66c

No. 129—15,000 lbs., No. 48; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, 2,000 lbs.

Whitaker Paper Co.	24.50c
Carpenter Paper Co.	26.14c
Old Dominion Paper Co.	20.479c
Chatfield Paper Co.	23.85c
Paper Corp. of U. S.	19.00c
Garrett-Buchanan Co.	24.50c
Walker Goulard Plehn Co.	21.47c
Chatfield & Woods Co. of Pa.	23.90c
Barton, Duer & Koch Paper Co.	20.85c
R. P. Andrews Paper Co.	24.26c

Stanford Paper Co.	24.50c
Graham Paper Co.	24.27c

100 Per Cent Declaration Bond

No. 140—6,000 lbs., Nos. 32 and 40; flat, cut 25½x33 ins. Min. order, one substance, 3,000 lbs.

Old Dominion Paper Co.	23.98c
Walker Goulard Plehn Co.	23.89c
Stanford Paper Co.	26.70c

100 Per Cent Parchment Deed

No. 141—10,000 lbs., No. 64; flat, cut 33x34 ins. Min. order, 2,000 lbs.

Old Dominion Paper Co.	22.477c
Paper Corp. of U. S.	22.47c
Walker Goulard Plehn Co.	22.43c
R. P. Andrews Paper Co.	25.12c

Chemical Wood White Ledger

No. 151—400,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 42 ins. Min. order, one substance, 10,000 lbs.

Mudge Paper Co.		8.96c
D. L. Ward Co.	(200,000 lbs.)	7.43c
Barton, Duer & Koch Paper Co.		7.60c
Eastern Corp.		7.47c
Marquette Paper Co.	(6,000,000 lbs. max. on several classes) (1,300,000 lbs. max. on several classes)	6.49c
		7.90c
Stanford Paper Co.	(100,00 lbs.)	9.00c
Perkins-Goodwin Co.		7.84c
Aetna Paper Co.		6.98c
Central Ohio Paper Co.	(200,000 lbs.)	7.29c

25 Per Cent Ledger, White and Colored

No. 154—250,000 lbs., white, Nos. 48 and 56; flat, cut 22x34, 24x38, 28x34, 32x42 and 34x44 ins. Min. order, one substance, 5,000 lbs.

Whitaker Paper Co.		13.41c
Mudge Paper Co.		10.74c
Garrett-Buchanan Co.		11.61c
Walker Goulard Plehn Co.		11.43c
Bulkley Dunton Co.		12.00c
Collins Mfg. Co.	(100,000 lbs.)	9.935c
	(100,000 lbs.)	10.60c
	(50,000 lbs.)	10.75c
Aetna Paper Co.		10.24c

No. 155—150,000 lbs., white, No. 64; flat, cut 24x38, 28x34, 32x42 and 34x44 ins. Min. order, 5,000 lbs.

Whitaker Paper Co.		13.41c
Carpenter Paper Co.		13.88c
Mudge Paper Co.		10.94c
Walker Goulard Plehn Co.		11.43c
Willcox, Walter Furlong Paper Co.		11.61c
R. P. Andrews Paper Co.		13.67c
Bulkley Dunton & Co.		12.25c
Collins Mfg. Co.	(100,000 lbs.)	9.935c
	(50,000 lbs.)	10.60c
Aetna Paper Co.		10.73c

No. 156—300,000 lbs., blue, buff, green, pink, salmon and yellow, No. 64; flat, cut 24x38, 28x34, and 34x44 ins. Min. order, one substance, one color, 3,000 lbs.

Bradner Smith & Co.	(100,000 lbs.)	14.95c
Mudge Paper Co.	(10,000 lbs. min. of one color)	11.94c
Walker Goulard Plehn Co.		11.73c
Collins Mfg. Co.	(100,000 lbs.)	10.29c
	(100,000 lbs.)	10.79c
	(100,000 lbs.)	10.97c
Aetna Paper Co.		11.48c

50 Per Cent Ledger, White and Colored

No. 160—20,000 lbs., white, Nos. 48 and 56; flat, cut 18½x36, 18½x40¼, 24x38, 28x29, 28x34, 29x41, and 32x42 ins. Min. order, one substance, 10,000 lbs.

Whitaker Paper Co.	17.00c
Bradner Smith & Co.	15.22c
Mudge Paper Co.	12.85c
Old Dominion Paper Co.	16.98c
Chatfield Paper Co.	14.65c
Paper Corp. of U. S.	12.83c
Garrett-Buchanan Co.	17.00c
Walker Goulard Plehn Co.	14.49c
Barton, Duer & Koch Paper Co.	12.90c
R. P. Andrews Paper Co.	13.97c
Stanford Paper Co.	17.00c
Collins Mfg. Co.	12.80c
Graham Paper Co.	16.99c
Aetna Paper Co.	14.24c

No. 161—10,000 lbs., white, No. 64; flat, cut 23x36 and 32x42 ins. Min. order, 10,000 lbs.

Whitaker Paper Co.	17.00c
Bradner Smith & Co.	15.22c
Mudge Paper Co.	13.15c
Old Dominion Paper Co.	16.98c
Chatfield Paper Co.	14.80c
Paper Corp. of U. S.	12.83c
Garrett-Buchanan Co.	17.00c
Walker Goulard Plehn Co.	14.49c
Barton, Duer & Koch Paper Co.	13.15c
R. P. Andrews Paper Co.	13.97c
Stanford Paper Co.	17.00c
Collins Mfg. Co.	12.80c
Graham Paper Co.	16.99c
Aetna Paper Co.	14.24c

No. 162—10,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, Nos. 56 and 64; flat, cut 18½x36, 18½x40¼, 19x24, 23x36, 28x34 and 32x42 ins. Min. order, one substance, one color, 5,000 lbs.

Whitaker Paper Co.	17.75c
Old Dominion Paper Co.	17.69c
Chatfield Paper Co.	15.95c
Garrett-Buchanan Co.	17.75c
Walker-Goulard Plehn Co.	14.93c
Barton, Duer & Koch Paper Co.	14.45c
Stanford Paper Co.	17.75c
Collins Mfg. Co.	13.10c
Graham Paper Co.	17.72c
Central Ohio Paper Co.	14.74c

75 Per Cent Ledger, White and Colored

No. 168—8,000 lbs., white, Nos. 48 and 56; flat, cut 21x32, 24x38, 28x29, and 28x34 ins. Min. order, one substance, 4,000 lbs.

Whitaker Paper Co.	19.50c
Mudge Paper Co.	18.00c
Old Dominion Paper Co.	19.46c
Paper Corp. of U. S.	17.06c
Garrett-Buchanan Co.	19.50c
Walker Goulard Plehn Co.	17.89c
Barton, Duer & Koch Paper Co.	17.90c
Bulkley Dunton & Co.	19.50c
Stanford Paper Co.	19.50c
Graham Paper Co.	19.42c

No. 169—10,000 lbs., white, No. 64; flat, cut 21x32, 23x36, 24x38, and 28x34 ins. Min. order, 5,000 lbs.

Whitaker Paper Co.	19.50c
Mudge Paper Co.	18.00c
Old Dominion Paper Co.	19.46c
Paper Corp. of U. S.	17.06c
Garrett-Buchanan Co.	19.50c
Walker Goulard Plehn Co.	17.89c
Barton, Duer & Koch Paper Co.	17.90c
Bulkley Dunton & Co.	19.50c
Stanford Paper Co.	19.50c
Graham Paper Co.	19.42c

No. 170—6,000 lbs., blue, buff, cherry, green, pink, salmon and yellow. No. 64; flat, cut 24x38, 28x34, and 34x44 ins. Min. order, one substance, one color, 3,000 lbs.

Whitaker Paper Co.	20.25c
Old Dominion Paper Co.	20.19c
Garrett-Buchanan Co.	20.25c
Walker Goulard Plehn Co.	18.89c
Barton, Duer & Koch Paper Co.	19.50c
Stanford Paper Co.	20.25c
Graham Paper Co.	20.15c

100 Per Cent White Ledger

No. 176—60,000 lbs., No. 48; flat, cut 24x38, 28x34, and 32x42 ins. Min. order, 4,000 lbs.

Whitaker Paper Co.	23.50c
Old Dominion Paper Co.	23.448c
Paper Corp. of U. S.	20.45c
Garrett-Buchanan Co.	23.50c
Walker Goulard Plehn Co.	20.93c
Barton, Duer & Koch Paper Co.	21.35c
R. P. Andrews Paper Co.	25.74c
Bulkley Dunton & Co.	28.00c
Stanford Paper Co.	23.50c
Graham Paper Co.	23.30c

No. 177—30,000 lbs., No. 64; flat, cut 24x38, 28x34, and 32x42 ins. Min. order, 5,000 lbs.

Whitaker Paper Co.	23.50c
Old Dominion Paper Co.	23.448c
Paper Corp. of U. S.	20.45c
Garrett-Buchanan Co.	23.50c
Walker Goulard Plehn Co.	20.93c
Barton, Duer & Koch Paper Co.	21.35c
R. P. Andrews Paper Co.	25.74c
Bulkley Dunton & Co.	28.00c
Stanford Paper Co.	23.50c
Graham Paper Co.	23.30c
Central Ohio Paper Co.	24.90c
Tobey Fine Paper Inc.	24.90c

Chemical Wood White Index

No. 183—200,000 lbs., 22½x28½—148; flat, cut any size, min. width 17 ins., max. width 42 ins.

Whitaker Paper Co.		7.45c
Paper Corp. of U. S.	(100,000 lbs.)	8.10c
R. P. Andrews Paper Co.		7.37c
Perkins Godwin Co.		7.24c

No. 184—1,200,000 lbs., 22½x28½—182 and 280; flat, cut 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Whitaker Paper Co.	(600,000 lbs.)	7.35c
	(600,000 lbs.)	7.45c
Mudge Paper Co.	(400,000 lbs.)	7.49c
D. L. Ward Co.		6.39c
Old Dominion Paper Co.		6.3989c
George W. Millar & Co.		6.40c
Paper Corp. of U. S.	(500,000 lbs.)	7.99c
Garrett-Buchanan Co.		6.40c
Chatfield & Woods Co. of Pa.		6.59c
Barton, Duer & Koch Paper Co.		6.37c
Frank Parsons Paper Co.		6.744c
Willcox, Walter Furlong Paper Co.		6.40c
R. P. Andrews Paper Co.		7.37c
Stanford Paper Co.		6.40c
Millcraft Paper Co.		6.40c
Perkins-Goodwin Co.	(500,000 lbs.)	7.24c

50 Per Cent Index, White and Colored

No. 189—250,000 lbs., white, 22½x28½—148; flat cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Whitaker Paper Co.		12.48c
Cauthorne Paper Co.		12.96c
Mudge Paper Co.	(50,000 lbs.)	12.73c
Old Dominion Paper Co.		16.89c
Paper Corp. of U. S.		13.45c
Garrett-Buchanan Co.		17.00c
Walker Goulard Plehn Co.		11.25c
Barton, Duer & Koch Paper Co.		10.39c
Frank Parsons Paper Co.		14.36c
R. P. Andrews Paper Co.		11.23c
Bulkley Dunton & Co.	(100,000 lbs.)	12.48c
Stanford Paper Co.		13.50c
Collins Mfg. Co.	(100,000 lbs.)	10.49c
	(100,000 lbs.)	10.69c
	(50,000 lbs.)	10.89c
Graham Paper Co.		16.85c
Aetna Paper Co.		9.94c

No. 190—1,200,000 lbs., white, 22½x28½—182 and 280; flat, cut 24x38, 28x34, 32½x42, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Whitaker Paper Co.	(250,000 lbs.)	12.08c
	(500,000 lbs.)	12.48c
	(450,000 lbs.)	12.78c
Mudge Paper Co.	(100,000 lbs.)	12.73c
D. L. Ward Co.	(200,000 lbs.)	13.50c
Old Dominion Paper Co.	(300,000 lbs.)	14.869c
Bermingham & Prosser Co.	(200,000 lbs.)	12.48c
Paper Corp. of U. S.	(250,000 lbs.)	12.80c
Walker Goulard Plehn Co.	(500,000 lbs.)	11.30c
	(700,000 lbs.)	11.70c
Chatfield & Woods Co. of Pa.	(200,000 lbs.)	13.50c
Barton, Duer & Koch Paper Co.	(400,000 lbs.)	10.39c
	(400,000 lbs.)	10.73c
	(400,000 lbs.)	10.96c
Bulkley Dunton & Co.	(200,000 lbs.)	12.48c
Stanford Paper Co.	(200,000 lbs.)	13.50c
Collins Mfg. Co.	(200,000 lbs.)	11.49c
	(200,000 lbs.)	11.69c
	(400,000 lbs.)	12.10c
	(400,000 lbs.)	12.10c
Mathers-Lamm Paper Co.	(100,000 lbs.)	14.68c
Butler Co.	(200,000 lbs.)	13.38c

No. 191—700,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, 22½x28½—182 and 280; flat, cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

D. L. Ward Co.....(200,000 lbs.) 14.00c
Bermingham & Prosser Co.....
(100,000 lbs.) 13.23c
Paper Corp. of U. S. (250,000 lbs.) 13.55c
Walker Goulard Plehn Co..... 11.90c
Chatfield & Woods Co. of Pa.....
(200,000 lbs.) 14.00c
Barton, Duer & Koch Paper Co... 10.94c
Bulkley Dunton & Co.....
(100,000 lbs.) 13.23c
Stanford Paper Co..... 17.00c
Collins Mfg. Co.....(250,000 lbs.) 11.85c
(250,000 lbs.) 12.35c
(250,000 lbs.) 12.45c

No. 192—300,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, 22½x28½—148; flat, cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Whitaker Paper Co..... 17.75c
Mudge Paper Co....(100,000 lbs.) 13.48c
Old Dominion Paper Co..... 17.66c
Chatfield Paper Co..... 14.00c
Garrett-Buchanan Co. 17.75c
Walker Goulard Plehn Co..... 11.65c
Barton, Duer & Koch Paper Co... 10.94c
Frank Parsons Paper Co..... 14.62c
R. P. Andrews Paper Co..... 11.43c
Stanford Paper Co..... 14.00c
Collins Mfg. Co.....(100,000 lbs.) 10.85c
(100,000 lbs.) 11.35c
(100,000 lbs.) 12.06c
Graham Paper Co..... 14.00c
Butler Co. 14.00c
Aetna Paper Co..... 9.97c
Central Ohio Paper Co..... 14.00c

100 Per Cent White Index

No. 195—40,000 lbs., 22½x28½—148; flat, cut 24x38, 28x34, and 32x42 ins.

Whitaker Paper Co..... 23.50c
Old Dominion Paper Co..... 23.42c
Paper Corp. of U. S..... 21.47c
Garrett-Buchanan Co. 23.50c
Walker Goulard Plehn Co..... 19.89c
Barton, Duer & Koch Paper Co... 21.35c
R. P. Andrews Paper Co..... 24.68c
Stanford Paper Co..... 23.50c
Graham Paper Co..... 23.30c

No. 196—250,000 lbs., 22½x28½—approximately 206; flat, cut 20½x30½ and 34½x44 ins.

Whitaker Paper Co..... 23.50c
Old Dominion Paper Co..... 23.379c
Paper Corp. of U. S..... 21.47c
Garrett-Buchanan Co. 23.50c
Walker Goulard Plehn Co..... 19.89c
Barton, Duer & Koch Paper Co... 20.85c
R. P. Andrews Paper Co..... 24.79c
Stanford Paper Co..... 23.50c
Graham Paper Co..... 23.30c

No. 201—50,000 lbs., white, 20x26—130; flat, 26½x41 ins., the grain to run lengthwise of the sheet. Min. order, 5,000 lbs.

Whitaker Paper Co..... 9.75c
Old Dominion Paper Co.....
(50,000 lbs.) 9.248c
Walker Goulard Plehn Co..... 7.42c
7.90c
Marquette Paper Co..... 7.89c

Coated Cover, White and Colored

No. 202—40,000 lbs., India tint and light green, 20x26—100; flat, 26½x41 ins. Min. order, 5,000 lbs.

Whitaker Paper Co.....(India) 10.30c
(Light green) 10.80c
Walker Goulard Plehn Co..... 7.82c
8.30c
Chicago Paper Co..... 9.65c
Marquette Paper Co..... 8.69c

Antique-Finish Cover, White and Colored

No. 203—800,000 lbs., antique; white, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and yellow; flat, 19½x25¼—95, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

Whitaker Paper Co..... 6.80c
Bradner Smith & Co..... 8.82c
D. L. Ward Co.....(200,000 lbs.) 8.50c
Chatfield Paper Co....(200,000 lbs.) 8.50c
Chatfield & Woods Co. of Pa.....
(200,000 lbs.) 8.50c
Barton, Duer & Koch Paper Co... 9.215c
R. P. Andrews Co..... 7.37c
Marquette Paper Co...(6,000,000
lbs. max. for several classes).. 8.44c
Stanford Paper Co..... 7.63c
Graham Paper Co....(200,000 lbs.) 8.50c
Butler Co. .....(250,000 lbs.) 8.50c
Aetna Paper Co.....(200,000 lbs.) 8.50c

50 Per Cent Laid Cover, Colored

No. 205—150,000 lbs., blue, cream, white gray and green, 20x26—130; flat, cut 19½x25¼ ins., in wrapped bundles with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

Whitaker Paper Co..... 11.23c
Bradner Smith Co..... 12.92c
R. P. Andrews Paper Co..... 11.27c

Wood Manila

No. 208—200,000 lbs., 24x36—80 and 100; flat, cut 25x38 and 32x42 ins., in wrapped bundles with projecting colored-paper marker between each 500 sheets.

Whitaker Paper Co..... 4.75c
D. L. Ward Co..... 5.24c
Old Dominion Paper Co..... 5.244c
Bermingham & Prosser Co..... 5.38c
Paper Corp. of U. S..... 5.32c
National Pulp & Paper Co.....
(cl. lots) 4.50c
Walker Goulard Plehn Co..... 5.25c
Frank Parsons Paper Co..... 4.69c
Bulkley Dunton & Co..... 5.50c

No. 209—300,000 lbs., 24x36—80 and 100; rolls, 21 and 36 ins. wide (3-inch fiber cores).

Whitaker Paper Co..... 4.375c
D. L. Ward Co..... 4.84c
Old Dominion Paper Co..... 4.844c
Bermingham & Prosser Co..... 4.99c
Paper Corp. of U. S..... 4.92c
Walker Goulard Plehn Co..... 4.85c
Frank Parsons Paper Co..... 4.29c
Bulkley Dunton & Co..... 4.40c

No. 210—80,000 lbs., 24x36—120; rolls, 18-ins. diameter, 4¼, 5¾, and 7½ ins. wide, wound on wooden plugs, 1½-in. hole.

Whitaker Paper Co..... 4.50c
D. L. Ward Co..... 5.34c
Old Dominion Paper Co..... 5.344c
Bermingham & Prosser Co..... 5.62c
Walker Goulard Plehn Co..... 5.39c
Bulkley Dunton & Co..... 5.75c

Chemical Wood Manila

No. 211—100,000 lbs., 24x36—140 and 160; flat, cut any size in wrapped bundles. Min. order, one weight, 5,000 lbs.

Paper Corp. of U. S..... 7.41c
R. P. Andrews Paper Co..... 7.65c

Rope Manila

No. 213—100,000 lbs., 24x36—160 and 280; rolls, 48 ins. wide (3-inch fiber cores). Min. order, 5,000 lbs.

Paper Corp. of U. S..... 18.49c
R. P. Andrews Paper Co.....
(160 lb.) 19.00c
(280 lb.) 18.00c
Perkins-Goodwin Co.....(280 lb.) 18.50c
(160 lb.) 19.00c

Drumhead Manila

No. 215—60,000 lbs., 24x36—280; flat, cut 32x42 ins. Min. order, 5,000 lbs.

Mudge Paper Co..... 19.45c
Paper Corp. of U. S..... 19.23c
Perkins-Goodwin Co. 19.50c

No. 2 Kraft

No. 217—500,000 lbs., 24x36—80 to 160; flat, cut any size in wrapped bundles.

Whitaker Paper Co..... 4.57c
D. L. Ward Co..... 4.74c
Old Dominion Paper Co..... 4.7489c
George W. Millar & Co..... 4.75c
Garrett-Buchanan Co. 4.75c
Chatfield & Woods Co. of Pa..... 4.892c
W. L. Jones, Inc..... 4.65c
Barton, Duer & Koch Paper Co.. 4.75c
Willcox, Walter Furlong Co..... 4.75c
R. P. Andrews Paper Co..... 4.554c
Stanford Paper Co..... 4.75c
Mathers-Lamm Paper Co..... 4.41c
Millcraft Paper Co..... 4.75c

No. 218—500,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold), in wrapped bundles.

Whitaker Paper Co..... 4.57c
D. L. Ward Co..... 4.74c
Old Dominion Paper Co..... 4.7489c
George W. Millar & Co..... 4.75c
Garrett Buchanan Co..... 4.75c
Chatfield & Woods Co. of Pa.... 4.892c
W. L. Jones, Inc..... 4.65c
Barton, Duer & Koch Paper Co.. 4.75c
Willcox, Walter Furlong Co. 4.75c
R. P. Andrews Paper Co..... 4.554c
Stanford Paper Co..... 4.75c
Mathers-Lamm Paper Co..... 4.41c
Millcraft Paper Co..... 4.75c

No. 219—400,000 lbs., 24x36—80 to 160, rolls, minimum width 9 ins., maximum width 48 ins., wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

Whitaker Paper Co..... 4.32c
Old Dominion Paper Co..... 4.4984c
D. L. Ward Co..... 4.49c
George W. Millar & Co..... 4.50c
Paper Sales Agency Co..... 4.40c
Garrett-Buchanan Co. 4.50c
Chatfield & Woods Co. of Pa.... 4.635c
W. L. Jones, Inc..... 4.41c
Barton, Duer & Koch Paper Co.. 4.50c
Willcox, Walter Furlong Co..... 4.50c
R. P. Andrews Paper Co..... 4.31c
Stanford Paper Co..... 4.50c
Mathers-Lamm Paper Co..... 4.16c
Millcraft Paper Co..... 4.50c
Perkins-Goodwin Co. 4.4214c

White Gummed

No. 252—2,000,000 sheets, flat, 22x34 ins. Min. order, 25,000 sheets.

	Per M sheets
Whitaker Paper Co.....	$13.46
Carpenter Paper Co.....	13.61
Nashua Gummed & Coated Paper Co. .....(1,000,000 sheets)	15.20
Mudge Paper Co.....(1,000,000 sheets)	14.60
Old Dominion Paper Co.....	10.692
Chatfield Paper Co.....	13.88
George W. Millar & Co.....	13.07
Paper Corp. of U. S.....	10.605
Chatfield & Woods Co. of Pa....	13.59
Eureka Specialty Printing Co....	12.67
Barton, Duer & Koch Paper Co...	13.60
R. P. Andrews Paper Co.....	10.97
Swigart Paper Co.....	10.72
Bulkley Dunton & Co.....	13.88
Stanford Paper Co.....	13.59
Virginia Paper Co.....	10.72
Graham Paper Co.....	10.66
Butler Co.	10.56
Tobey Fine Paper, Inc.....	13.08

25 Per Cent Blotting, White and Colored

No. 254—40,000 lbs., white, flat, 19x24—160, in wrapped bundles. Min. order, 10,000 lbs.

Whitaker Paper Co..... 7.41c
Bradner Smith & Co..... 7.482c
Cauthorne Paper Co..... 7.40c
Mudge Paper Co..... 7.39c
Old Dominion Paper Co..... 7.39c
Chatfield Paper Co..... 7.60c
George W. Millar & Co..... 9.98c
Walker Goulard Plehn Co..... 9.98c
Chatfield & Woods Co. of Pa.... 9.98c
Barton, Duer & Koch Paper Co... 7.54c
R. P. Andrews Paper Co..... 7.23c
Bulkley Dunton & Co..... 9.98c
Stanford Paper Co..... 7.60c
Virginia Paper Co..... 7.40c
Graham Paper Co..... 7.56c
Mathers-Lamm Paper Co..... 7.303c
Millcraft Paper Co..... 7.40c
Butler Co. 7.60c
Perkins-Goodwin Co. 9.98c
Central Ohio Paper Co..... 7.60c
Tobey Fine Paper, Inc..... 9.98c

No. 255—400,000 lbs., buff, salmon and moss green; flat, 19x24—160, in wrapped bundles. Min. order, one color, 2,000 lbs.

Whitaker Paper Co..... 7.37c
Bradner Smith & Co.....(salmon) 7.61c
(buff) 7.768c
(moss green) 8.123c
Cauthorne Paper Co..... 7.90c
Mudge Paper Co..... 7.89c
Old Dominion Paper Co..... 7.874c
Chatfield Paper Co.....(salmon) 7.73c
(buff) 7.89c
(moss green) 8.25c
George W. Millar & Co.....
(salmon and buff) 10.10c
(moss green) 10.50c

Walker Goulard Plehn Co.		
	(salmon and buff)	10.10c
	(moss green)	10.50c
Chatfield & Woods Co. of Pa.		
	(salmon and buff)	10.10c
	(moss green)	10.50c
Barton, Duer & Koch Paper Co.		
	(salmon)	7.70c
	(buff)	7.85c
	(moss green)	8.19c
R. P. Andrews Paper Co.		7.73c
Bulkley Dunton & Co.		10.10c
		10.50c
Sanford Paper Co.		7.73c
		7.89c
		8.25c
Virginia Paper Co.		7.90c
Graham Paper Co.		7.85c
		7.69c
		8.21c
Mathers-Lamm Paper Co.		7.763c
Millcraft Paper Co.		7.90c
Butler Co.		7.73c
		7.89c
		8.25c
Perkins-Goodwin Co.		10.10c
		10.50c
Central Ohio Paper Co.		7.73c
		7.89c
		8.25c
Tobey Fine Paper, Inc.		10.10c
High-Finish Red Sulphite		10.50c

High-Finish Red Sulphite

No. 265—50,000 lbs., flat, 24x36—320, in wrapped bundles. Min. order, 5,000 lbs.

Mudge Paper Co.	8.25c
Paper Corp. of U. S.	7.25c
Marquette Paper Co.	8.37c

High-Finish Chemical Wood Manila Tag

No. 271—250,000 lbs., 24x36—280; flat, cut any size, min. width 24 ins., max. width 38 ins., in wrapped bundles.

Whitaker Paper Co.		5.98c
D. L. Ward Co.		5.99c
Old Dominion Paper Co.		5.9988c
George W. Millar & Co.		6.00c
Paper Corp. of U. S.		
	(150,000 lbs.)	5.97c
Garrett Buchanan Co.		6.00c
Chatfield & Woods Co. of Pa.		6.18c
Barton, Duer & Koch Paper Co.		5.98c
Willcox, Walter Furlong Co.		6.00c
R. P. Andrews Paper Co.		7.00c
Stanford Paper Co.		6.00c
Millcraft Paper Co.		6.00c

Calendered Tag, Manila and Colored

No. 276—1,500,000 lbs., manila, 22½x28½—150; rolls, 23¼ and 26½ ins. wide (6-inch iron cores).

Barton, Duer & Koch Paper Co.	8.25c

No. 277—120,000 lbs., blue, brown, green, ivory, pink, red, salmon and yellow, 22½x28½—150; rolls 23¼ and 26½ ins. wide (6-inch iron cores). Min. order, one color, 10,000 lbs.

Barton, Duer & Koch Paper Co.	9.25c

Jute Tag

No. 280—300,000 lbs., 22½x28½—200 and 280; flat, cut 28x38 ins., in wrapped bundles. Min. order, one weight, 10,000 lbs.

Mudge Paper Co.	10.25c
Paper Corp. of U. S.	10.25c

Manila Board

No. 281—100,000 lbs., 22½x28½—400; flat, cut 22x34 ins., in wrapped bundles with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

Bradner Smith & Co.	5.15c
Old Dominion Paper Co. (cl lots)	5.24c
Paper Corp. of U. S.	4.93c
Chatfield & Wood of Pa.	5.25c
Barton, Duer & Koch Paper Co.	5.25c

Railroad Board, White and Colored

No. 302—150,000 sheets, white, flat, 22x34 ins., 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, 10,000 sheets.

		(per M sheets)
Whitaker Paper Co.		$35.47
Bradner Smith & Co.	(cases)	32.10
	(skids)	31.13
D. L. Ward	(cases)	32.60
	(skids)	31.62
Old Dominion Paper Co.	(cases)	$32.564
	(skids)	31.568
Paper Corp. of U. S.		33.00
Walker Goulard Plehn Co.		32.87
Barton, Duer & Koch Paper Co.		32.50
R. P. Andrews Paper Co.		31.62
A. M. Collins Mfg. Co.	(cases)	32.60
	(skids)	31.62
Stanford Paper Co.	(cases)	32.60
	(skids)	31.62

No. 303—100,000 sheets, white, flat, 22x34 ins., 8-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, 5,000 sheets.

Whitaker Paper Co.		$51.04
Bradner Smith & Co.	(cases)	46.17
	(skids)	44.70
D. L. Ward & Co.	(cases)	46.90
	(skids)	45.95
Old Dominion Paper Co.	(cases)	46.849
	(skids)	45.429
Paper Corp. of U. S.		47.50
Walker Goulard Plehn Co.		47.30
Barton, Duer & Koch Co.		47.85
R. P. Andrews Paper Co.		47.49
A. M. Collins Mfg. Co.		45.85
Bulkley Dunton & Co.	(cases)	46.90
	(skids)	45.44
Stanford Paper Co.	(cases)	46.80
	(skids)	45.39

No. 304—80,000 sheets, white, flat, 22x34 ins., 14-ply, each 50 sheets fully banded, packed in wooden cases. Min. order, 5,000 sheets.

Bradner Smith & Co.	(cases)	$67.83
	(skids)	64.79
D. L. Ward Co.	(cases)	68.90
	(skids)	66.83
Old Dominion Paper Co.	(cases)	68.829
	(skids)	66.739
Paper Corp. of U. S.		69.80
Walker Goulard Plehn Co.		69.49
Barton, Duer & Koch Paper Co.		56.85
R. P. Andrews Paper Co.		56.83
A. M. Collins Mfg. Co.		65.00
Bulkley Dunton & Co.	(cases)	68.93
	(skids)	66.83
Stanford Paper Co.	(cases)	68.90
	(skids)	66.83

No. 305—150,000 sheets, ash gray, green and orange, flat, 22x34 ins., 4-ply, each 100 sheets fully banded, packed in wooden cases. Min. order, one color, 5,000 sheets.

Bradner Smith & Co.	(cases)	$40.16
	(skids)	38.98
D. L. Ward Co.	(cases)	40.80
	(skids)	39.60
Old Dominion Paper Co.	(cases)	40.749
	(skids)	39.558
Paper Corp. of U. S.		41.32
Walker Goulard Plehn Co.		41.15
Barton, Duer & Koch Paper Co.		40.70
R. P. Andrews Paper Co.		39.60
A. M. Collins Mfg. Co.		40.20
Bulkley Dunton & Co.	(cases)	40.89
	(skids)	39.60
Stanford Paper Co.	(cases)	40.65
	(skids)	39.45

Wood Bristol, Colored

No. 306—350,000 lbs., buff, 22½x28½—150; rolls, 20 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	5.1399c
Barton, Duer & Koch Paper Co.	5.09c
Frank Parsons Paper Co.	5.14c
Bulkley Dunton & Co.	5.25c

No. 307—120,000 lbs., melon, flat, 20x30—172; in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Old Dominion Paper Co.	5.343c
Barton, Duer & Koch Paper Co.	5.345c
Frank Parsons Paper Co.	5.39c
Bulkley Dunton & Co.	5.50c

No. 308—200,000 lbs., buff, gray, green, melon, pink and yellow, 22½x28½—184; rolls, 20 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	5.2394c
Barton, Duer & Koch Paper Co.	5.24c
Frank Parsons Paper Co.	5.14c
Bulkley Dunton & Co.	5.25c

No. 309—200,000 lbs., buff, gray, green, melon, pink and yellow, 22½x28½—184; rolls, 20 ins. wide (6-inch iron cores).

Old Dominion Paper Co.	5.2394c
Barton, Duer & Koch Paper Co.	5.24c
Frank Parsons Paper Co.	5.14c
Bulkley Dunton & Co.	5.25c

United States Postal Card Bristol

No. 325—3,000,000 lbs., 22½x28½—188; rolls, 22 and 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

Whitaker Paper Co.	5.32c
St. Regis Paper Co.	6.50c
Barton, Duer & Koch Paper Co.	5.49c

No. 326—3,000,000 lbs., 22½x28½—188; rolls, 22 and 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

Whitaker Paper Co.		
	(1 500,000 lbs.)	5.34c
	(1,500,000 lbs.)	5.47c
Walker Goulard Plehn Co.		
	(500,000 lbs.)	6.45c
Barton, Duer & Koch Paper Co.		
	(1,500,000 lbs.)	5.39c

No. 327—4,000,000 lbs., 22½x28½—188; rolls, 22 and 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

Whitaker Paper Co.		5.50c
D. L. Ward Co.	(500,000 lbs.)	6.44c
R. P. Andrews Paper Co.		5.36c

Pressboard, Colored

No. 351—40,000 sheets, red, flat, 24x32 ins., thickness .0140 inch. Min. order, 5,000 sheets.

	(per C sheets)
Whitaker Paper Co.	$7.52
D. L. Ward Co.	7.58
Resolute Paper Products Co.	7.4675
Garrett Buchanan Co.	7.59
Walker Goulard Plehn Co.	7.75
Barton, Duer & Koch Paper Co.	7.75

No. 352—30,000 sheets, gray, flat, 30x36 ins., thickness .0300 inch. Min. order, 5,000 sheets.

	(per C sheets)
Whitaker Paper Co.	$24.46
D. L. Ward Co.	24.40
Resolute Paper Products Co.	24.00
Garrett Buchanan Co.	24.42
Walker Goulard Plehn Co.	24.75
Barton, Duer & Koch Paper Co.	18.85
Bird & Son, Inc.	18.50

News Board

No. 360—1,500,000 lbs., 26x38 ins., No. 100, flat, cut any size, min. 21x32 ins., max. 40x52½ ins. (to be trimmed square on four sides).

Whitaker Paper Co.		1.7967c
Cauthorne Paper Co.		2.23c
Mudge Paper Co.		1.816c
Bartgis Bros. Co.		2.175c
Old Dominion Paper Co.		1.9187c
Resolute Paper Products Co.		
	(400,000 lbs.)	2.375c
Clifton Paperboard Sales Co.		1.987c
Barton, Duer & Koch Paper Co.		1.84c
New Haven Pulp & Board Co.		2.375c
R. P. Andrews Paper Co.		1.81c
Stanford Paper Co.		1.82c
Virginia Paper Co.		1.817c
Mathers-Lamm Paper Co.		
	(750,000 lbs.)	2.058c

Binder's Board, No. 1 Quality

No. 366—900,000 lbs., flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Bartgis Bros. Co.	2.625c
Barton, Duer & Koch Paper Co.	4.225c
Consolidated Paper Co.	4.25c
R. P. Andrews Paper Co.	4.14c
Mathers-Lamm Paper Co.	3.935c

No. 367—120,000 lbs., 25¼x30¼ ins., Nos. 12 and 20; flat, to trim 34x44 ins.

Bartgis Bros. Co.	2.625c
Barton Duer & Koch Paper Co.	4.225c
Consolidated Paper Co.	4.25c
R. P. Andrews Paper Co.	4.14c

Binder's Board, Best Quality

No. 368—150,000 lbs., flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45. Min. order, 5,000 lbs.

Barton, Duer & Koch Paper Co.		
	(car lots)	5.25c
	(less than car lots)	5.75c
Consolidated Paper Co.		4.98c
R. P. Andrews Paper Co.		5.639c

OPA Revises Bag Prices

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1942—OPA has reduced manufacturers' prices for standard grocer's and variety bags five percent, which simultaneously cut distributors' mark-ups back to those prevailing early in 1941.

In taking this action, OPA set dollars and cents ceiling prices on manufacturers' sales and established maximum mark-ups on sales by paper merchants and other distributors.

The reductions reflect an OPA rollback in July of $5 per ton in the price of kraft bag papers—basic material in the manufacture of grocer's and variety bags.

Covered by the new amendment are all types of grocer's and variety bags including squares, flats, self-opening or automatic, and sacks as well as millinery, notion, liquor bottle, banana, candy, doughnut, garment, pants, laundry, nail, shopping and sugar bags. Excluded, however, are all bags made of specialty paper and transparent materials.

The new prices are set in Amendment No. 3 to Maximum Price Regulation No. 182-Kraft Wrapping, Bag, and Bag Papers. At the same time, by Amendment No. 11 to Maximum Price Regulation No. 129, OPA removed standard grocer's and variety bags from Regulation No. 129, which hitherto had controlled these articles at the manufacturing levels. The amendments are effective November 27.

Distributors' and wholesalers' prices previously were under the General Maximum Price Regulation. This regulation using March 1942 as a base period, froze the paper bag trade in an erratic price structure, which had come into being after the first half of 1941 as a result of a movement to build up inventories. Erratic price relationships are eliminated by this action.

In keeping with the industry's method of quoting prices, OPA's ceilings are expressed in terms of industry base price lists, less discounts. Price for both manufacturer and wholesalers are established by control of the size of discounts from common base prices. Discounts are expresed in terms of the number of cumulative five per cent reductions from the base, the expression 12/5s, for example indicating 12 five percent discounts.

The maximum price for the standard self-opening (automatic) kraft grocer's bags in carload lots under Maximum Price Regulation No. 129 was 25/5s from the standard industry grocer's bag discount lists. Amendment No. 3 to Maximum Price Regulation No. 182 lowers the maximum price for this item to 26/5s.

The maximum price at which merchants or distributors may sell the bags covered by this regulation to other merchants or distributors for resale is 2/5s over the manufacturer's price in lots of 10 bales or more. In quantities of less than 10 bales, the maximum resale markup of merchants who buy from other merchants or distributors shall not exceed the total mark-ups permitted to merchants who buy at mill prices.

No delivery charges may be added for shipments made by a distributor within any free delivery zone in which he made shipments during October 1, to 15, 1941. For L.C.L. shipments to other than free delivery zones, however, the distributor may add the differential used during October 1-15, 1941, or actual freight, whichever is lower.

Seek to Form New Shippers Group

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 23, 1942—A determined effort is being made to develop an association of shippers to effect transportation charges savings by pooling of freight. The movement was crystallized this week when a number of Chicago shippers and associations of shippers met at the Hotel Sherman on November 16 to discuss this method of cooperation.

The meeting was called by L. A. Chase, commerce attorney of Chicago, who reported that the paper association had exhibited a great deal of interest in the proposed organization but that the Delaware Valley Paper Shippers Association and other groups were now attending hearings and other sessions in Columbus and New York which prevented their being in attendance.

Those present indicated a desire to oppose freight forwarders in their efforts to stop pooling and pointed out that S.B.210, providing for the regulation of freight forwarders, provided the avenue for affecting savings which the industry should not overlook. Proposals were made to have such an association to develop news on legislation pertaining to shippers to provide adequate files on tariff information, to oppose legislation inimical to their interests and, in general, to solidify action in a nationwide way.

The conference exhibited enough outright enthusiasm to form an organization but eventually decided to hold another meeting at which time the paper industry and other interested parties would be able to be present to take part in the organization. All felt that Section 408 of S.B.210 opened a wide door to them in making assembling and distribution rates available not only to freight forwarders but also to "others who employ or utilize the instrumentalities or services of such common carriers under like conditions."

Power Show Opens Next Week

The Fifteenth National Exposition of Power and Mechanical Engineering will be held November 30 to December 4, inclusive at Madison Square Garden, 49th street, west of 8th avenue, New York. The show will open Monday at 2 P.M. and daily thereafter at 11 A.M.

The exposition this year has been organized for the special purpose of contributing to war production, information and the mental resources needed to increase power production, and to use it most efficiently. Exhibits illustrate hundreds of new solutions for problems that have arisen in thousands of manufacturing plants all over the country. Engineering consultants, versed in the design and application of equipment and specialties covering the whole field of power production and distribution will be in attendance for counsel and advice. Visitors representing industrial users of all classes are coming for information and instruction, many of them facing problems they have never encountered before.

Exhibitors who have enrolled for the exposition include the manufacturers of practically every kind of equipment used in power plants and also in the application of power to machinery. Many displays also concern the conservation of energy within plants. Exhibitors' products will include the following:

Heat and power production—Fuel handling equip-

ment, coal preparation, grates, stokers, exhaust silencers, draft equipment, boiler tubes, coils, heaters, refractories and insulation, industrial insulation and many other allied items.

Distribution and control—Drawn, welded and cast piping, coils, fittings, hangers, joints, reducing and relief valves, pipe fitting equipment and many other items.

Auxiliary equipment on display will include chemical feeders, pumps, steam traps, conduits, alarms, lubricators, and many other items of like equipment.

Instruments on exhibit will include draft gauges, recorders, water analyzers, flow meters, testing equipment and many other items.

Materials handling equipment will be represented by electric hoists, ratchet-lever hoists, lift trucks, elevators, conveyors, racks, electric and hand trucks.

The display of metals will include standard and special metals, alloys and treatments, resistant metals to high temperatures and pressures, abrasion and erosion under critical conditions and other items.

Engineering specialties on display will include dust collectors, lubricating systems, oil filters, belt dressing, cleaning compounds and other similar items.

The exhibits of machines and tools will include hand and portable electric tools, soldering tools, forging and rivet heaters, welders and many other items of equipment for the machine shop.

Admission to the exposition is by invitation and registration only. No admission fee is charged. The public is not admitted, but registrations are accepted from all persons interested in mechanical plants.

The exposition is under the management of the International Exposition Company, Charles F. Roth, manager, Grand Central Palace, New York.

Robert Gair Co. Changes

On November 1, Lee B. Morse was appointed to the staff of first vice president Norman F. Greenway, Robert Gair Company, Inc., New York, as manager of industrial relations in connection with activities pertaining to operating personnel in sales and production departments. Mr. Morse is a graduate of Cornell Electrical Engineering, came with Gair in 1929 as an industrial engineer and has been in charge of the industrial engineering department since 1934.

William J. Trimble has been promoted to manager of the company's industrial and engineering department. He attended Cornell and graduated from Purdue with a degree B.S. and E. He joined the industrial engineering staff in 1931.

Discuss Pulpwood Prices

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 23, 1942—Pulpwood ceiling prices ordered November 11 by the Office of Price Administration were the object of protests at a meeting at Iron River, Mich., November 14. It was attended by loggers, jumpers and paper and sawmill operators of the district. The delegation declared the order created "uncertainty and confusion," particularly with regard to the pulpwood production for the war program.

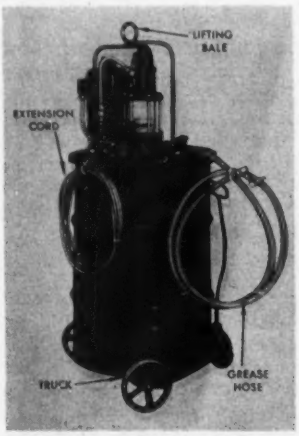
Operators expressed a willingness to cooperate to the extent of stepping up production, but declared they were having difficulty interpreting the order. The OPA will be asked to have its local officials contact the industry before arranging enforcement.

Another angle to the pulpwood situation is the demand by United States Senator Alexander Wiley of Wisconsin, that selective cutting be adopted for the nation's timber. "Indiscriminate logging of the nation's forests must be changed," he said. "Our forest resources are fast becoming as critical as steel or copper. Foresight on the home front is needed."

Such practices are also proposed for Wisconsin by the Wisconsin Conservation Commission, and legislation is in preparation to be submitted to the Legislature at its January session.

Electric-Hydraulic Barrel Pumps

Trabon Engineering Corporation, Cleveland, Ohio, manufacturer of industrial lubricating equipment, has just introduced its new Series H Electric-Hydraulic Barrel Pumps. These pumps are operated simply by plugging the extension cord into an electric outlet, thus permitting their use around a plant any time, and at any place an electric line is available. Due to this electric operation, these pumps are not only well adapted for service alongside a production line filling the bearings of various manufactured articles prior to their being shipped, — but also, are especially well suited for use by installation crews, setting up machinery in new plants, and by maintenance men working Sundays, holidays, etc., when compressed air, needed for operation of air driven pumps, usually is not available.



In addition to their wide field of usefulness, the manufacturer reports that the electric operation results in very low operating costs. The use of a non-compressible oil as a pumping agent, assures the discharging of the pumps' full rated capacity, at all times, regardless of whether the pressure head is high or low. These pumps are fully enclosed, and are sealed against the entrance of air . . . consequently, there is no opportunity for dirt, grit, or moisture to gain entrance to the pump in an air stream, with resulting wear, rusting, etc. The pumps are self-lubricating, and require little servicing.

The pump, complete with motor, hydraulic cylinder, etc., is mounted rigidly on a flanged head. The flange fits snugly over a standard 55 gal.—400 lb. drum permitting oil, or light medium or heavy grease to be pumped from the original shipping container without rehandling,—and a lifting bail is provided permitting the unit to be transferred easily from one drum to another, with a hand hoist or lifting bar.

A fully descriptive engineering bulletin, prices, etc., can be secured by writing Trabon Engineering Corporation, 1814 East 40th street, Cleveland, Ohio.

PAPER RANKED HIGH AS ESSENTIAL INDUSTRY

(Continued from page 31)

New uses are spinging up for paper everywhere. Many paper parts are now replacing metal parts in machinery; paper products are being developed to substitute for cloth in many cases.

The new uses that are being developed for paper products take up a large portion of the productive capacity of the industry and I think we can reasonably expect that paper and paper products will be on the critical list before the middle part of next year.

Non-essential uses of paper will have to be eliminated and we will have to conserve on our normal uses in order to provide the capacity for producing these new materials.

More and more paper is being used directly in the military program, in one form or another, which is also going to increase as the war progresses. The paper industry cannot be converted into the production of direct military materials like the automobile industry and other mechanical organizations. However, it is very successfully changing the products that it is producing so that they themselves are becoming highly essential to the whole war program.

Newsprint Manufacturers Association of the United States

LOUIS W. ADAMS, SECRETARY

What's the part of newsprint in winning this war? Let newspapers stop publishing for one day and immediately more than 100 million people would have a ready answer. There might be millions of different answers—doubtless there would be—but they would all add up to this: The American people want to know all the facts about practically everything, especially all that affects the winning of the war.

Newsprint users, the newspapers, told them about the need for scrap of all kinds. And what an enormous pile of scrap was made available as soon as the people read of the need for scrap to help win the war!

Its just the same about all this rationing business; all this business about man power uses and every industrial and home job. Newsprint via the newspapers can and does show us our part; helps us to find our place in the big job before us.

And finally, and even greater than all material things, newspapers on newsprint are the place where we all are brought together in our minds, our emotions and in spirit—these add up to create our national morale. Defeatism can't get a chance to raise its head while free men can get all the newsprint and newspapers they want.

How could you run this war without newsprint?

Kraft Paper Association

WILLARD J. DIXON, PRESIDENT

As in the case of every other industry, the present importance of the kraft paper manufacturing industry is to be measured by its contribution to the war and to essential civilian supply. While the essentiality of kraft paper is obvious it has thus far defied exact determination. This is because of the literally numberless uses to which kraft paper is put, both in civilian and war uses, and because of the fact that the same paper may be used both for essential and non-essential purposes. Once the paper has gone into commerce, tracing its ultimate use becomes an extremely complicated task. Both the War Production Board and the industry have been keenly aware of the problem, but no feasible method of tracing all of the products of the industry to their end uses has as yet been evolved.

In peace times the most important uses of kraft paper in the past have been for wrapping purposes and for bag and sack containers and in the conversion of the paper into familiar varieties of converted products. It is known to the housewife as grocery bags, notion bags, millinery bags and garment bags. It is known to industrial users in the form of multiwall sacks for cement, minerals, construction materials, etc. It is known to the retailers as the common form of wrapping paper. It is converted into gummed tape, envelopes, building insulation, tire wrap, coin wrap, paper towels, imitation window shades, sand paper and similar products. It has important industrial uses as anti-tarnish paper for wrapping aluminum sheets and parts, silverware, hardware, etc. There are a multitude of asphalted kraft papers for waterproofing. It is used to make books for the blind. It becomes an integral part of wire insulation and cable sheathing. It turns up as coal wrap for the packaging of processed coal; barrel liners; dynamite wrappers; clothing patterns; shirt bands; carpet cord and many kinds of waxed paper.

The predominant characteristic of kraft paper is its strength. Into this can be built during manufacture or conversion such specifications as wet strength, moisture or vapor transmission or repellence, oil resistance to either volatile or heavy lubricating oils, light resistance, rigidity and many other new characteristics.

The war has intensified a demand for some of the foregoing and has added many new uses and adaptations. More than ever before kraft paper is taking its place today as a substitute for cloth, burlap, canvas, wood, glass, tin, shopping baskets, boxes, thread, rubber, cotton waste, twine, rope, linen, metal staples, wire screens and jute. Special new uses are being developed constantly. A few of the developments in the use of kraft paper which contribute to the war effort and which can be revealed are the use of kraft paper in combination with plastics for the manufacture of radio panel boards, glider and airplane wings; new anti-corrosion paper; the interleaving of armored and steel plate in steel mills; various types of asphalted papers for convoy and export shipments; blackout and camouflage papers; practice bombs; shell cases and special wrappers for cartridges; new types of waterproof case liners; counter paper for military shoes; new types of duplex paper and twisted paper for substitution for burlap; flameproof paper; helmet liners; ignitor protector caps; metal coated papers; paper gas and rain capes; insect infestation and rat proof papers; multi-wall sand bags; cartridge and shell wadding; war bond envelopes and tank liners. Rapid progress is being made in the de-

velopment of tinless cans for motor oils for the petroleum industry which in a normal year uses 135,000 tons of tin for this purpose. Development of a multi-wall waterproof bag is under way to replace steel barrels for the shipping of oils and fats.

An annual production of 165,000 tons of dried eggs, more than 60,000 tons of dehydrated vegetables, 265,000 tons of dried skimmed milk, 42,000 tons of dried whole milk and 30,000 tons of dehydrated meat must all be packaged in moisture-proof containers. Kraft paper is used in the new five gallon container for dehydrated foods for the Army and Navy and for packaging matches for lifeboat rations. New one hundred pound open-mesh potato bags are being made as well as open-mesh peanut and wool bags for which burlap was used exclusively prior to the war.

As stringencies appear in other packing materials it is of the highest importance that the Kraft Paper Industry be permitted to retain sufficient flexibility so as to be able to step into the breach by manufacturing paper for new war uses.

In common with other industries the kraft paper industry is faced with enormously increased difficulties in obtaining its basic supplies. There have been shortages of wood, pulp and labor at one end of the production schedule and at the other, the industry is operating under the War Production Board Order M-241 which limits the average monthly production of paper. In spite of these difficulties the industry is still able to supply the needs of kraft paper of the types and quantities needed by its customers.

Writing Paper Manufacturers Association

Present estimates indicate that 42% of the entire domestic output of rag content writing papers was sold directly to the U. S. Government and its agencies, during the first six months of 1942. Estimates for the last half of this year indicate that this amount will be increased to about 60% of the total U. S. production. Of the 40% available in the last half of this year for the commercial market, more than one-half will be required by civilian concerns engaged in the production of war goods.

Rag Content Writing Papers	Estimated Production for Entire U. S. 1st 6 Months 1942 (Tons)	Estimated Per cent Going to U. S. Gov't and its Agencies 1st 6 Months 1942 (%)
Bonds and Writings	33,500	32
Ledgers	7,000	22
Manifold	3,500	51
Index	4,000	45
Papeterie & Weddings	1,400	12
Blue Print	11,500	80
All Others	7,700	50
Air-Dried	1,400	0
Total Rag Content Writing	70,000	42

In the second half of the current year, over 80% of the total blueprint paper production will be required for war purposes, either through direct Government use or for civilian concerns engaged in war production.

Sulphite writing paper shipments to the Government and its agencies for the first six months of this year are estimated at 12% of the total domestic production. Current orders for the Army, Navy, and other Government sources, have served to increase Government requirements. More than 25% of the total production is being taken by the Government in the second half of this year. Of the remainder available for the commercial market, more than one-half is being shipped to civilian concerns engaged in war production. Conservative estimates indicate that more than 60% of the total sulphite writing paper production for the second half of 1942 will be for war needs.

Sulphite Writing Papers	Estimated Production for Entire U. S. 1st 6 Months 1942 (Tons)	Estimated Per cent Going to U. S. Gov't and its Agencies 1st 6 Months 1942 (%)
Bonds Ledgers	275,000	10
Manifold	4,000	24
Mimeograph	52,000	33
Papeterie	23,000	1
Blue Print	2,000	80
Opaque Circular	4,000	1
Other Sulphite	20,000	7
Total Sulphite Writing	380,000	12

The use of text, cover, and specialty papers for printing of a morale-building nature, has become increasingly prominent. This has taken the form of commemorative programs and booklets, such as have been associated with ceremonies awarding "E" pennants by the service branches and speeches on such subjects as winning the war and winning the peace.

Writing paper, aside from the consumption by the U. S. Government and civilian concerns engaged in the production of war goods, is a necessity for such essential civilian organizations as insurance companies, banks, public utilities, railroads, etc., as well as by state and local governments.

ESTIMATED USAGE OF WRITING PAPERS, 2ND 6 MOS. 1942
(% of Normal Capacity)

Usage	% of Total Rag Content	% of Total Sulphite
War Work—U. S. Government & Agencies	60	25
War Work—Civilian Industries	20	35
War Work, Total	80	60
Non-War Work, Essential & Non-essential	20	40
	100	100

In summarizing, this is the situation: The combined requirements of the U. S. Government and war industry already take 80% of the rag content writing paper output of the country, and 60% of the sulphite writing paper. This leaves only 20% of the rag content and 40% of the sulphite writing paper to take care of essential civilian requirements, as well as the so-called non-essential activities of the country. Obviously, the share of the latter, based on normal capacity, is small indeed.

Tissue Association

J. M. Conway, President

In our daily reading one comes across the familiar terms of strategic materials, critical materials and essential materials. To many, these terms mean about the same thing, but to those familiar with the language being used in the wording of war necessities, they know that each of them has its own meaning, which denotes its relative importance to the war effort. They do not mean the same thing. Strategic materials are those absolutely necessary, but which are not to be found in substantial quantities or foreign materials which can no longer be imported into this country. Critical materials are those which are absolutely essential to the war effort, but in which the present manufacturing facilities are not sufficient to produce both civilian and war requirements, and they must, therefore, be rationed and used with great care. On the other hand, essential materials are those which are necessary for the conduct of the war and which exist in sufficient quantities to meet

all requirements if a bit of good judgment is used in their distribution.

In other words, all strategic and critical materials are essential, but not all essential materials are strategic or critical. This clarification is necessary when we speak of the Essentiality of Paper in the War Effort. Too many people confuse the term essential with critical, or strategic. In the special case of the tissue or light weight papers of all kinds, some of them might be strategic, and some critical, but I am sure, that you all will agree with me when I say that certainly all papers are essential.

Many people lose sight of the essentiality of paper because they see no connection between paper and aeroplanes, tanks, guns, ships and ammunition, but without the use of paper in some form or other, there could be no aeroplanes, tanks, guns, ships or ammunition. In producing these products, paper is used for drawing up contracts, correspondence, blueprints, order and sales blanks, washrooms in production plants, sanitary papers in the home to keep the employee well and fit for work, letters to the soldiers to maintain morale, issuing of orders in the Armed Forces, keeping records and thousands of other things too numerous to mention here.

Have you ever stopped to think of what would happen in homes and hospitals and factories and restaurants and other public places if sanitary papers of all sorts were eliminated or severely curtailed? When one gives any thought at all to this question, one cannot but realize that while paper itself will and cannot win the war, the products of war and the war itself could not be carried on without the use of huge quantities of paper in its many various forms. In your own individual life, just try to go an entire day without the use of paper in any form.

The paper industry occupies a unique place in this War Effort, in that it is doubly important. Most war industries were able to drop their domestic and peace-time business and markets and devote all of their energies to war production. Not so with the paper industry. The use of paper in every walk of life has become so important and so necessary that it was necessary for the industry to provide not only for peace-time needs, but for war needs as well, and at the same time take care of greatly expanded requirements of war production plants. This job is being done in almost efficient manner.

The essentiality of paper is also brought out in the history of the industry. It was one of the first major industries to come into existence in this country—why—because of its necessity in the lives of everyone—even the very earliest of our forefathers. Of course, in time of war, no one pretends to be able to win a war on paper, even if the pen is mightier than the sword, but conversely as mentioned above, one can't win a war without paper, and there are very few, if any substitutes.

Some people like to discuss the essentiality of paper from the standpoint of individual papers. This is wholly unnecessary because the emergency takes care of that portion of the paper industry, if there is one, that is unnecessary because substitutes will take the place of them or the use is eliminated entirely by the painful law of economics, loyalty to one's country, and service to humanity. Only those papers which are really essential can and will survive this emergency.

It is true that during this period of emergency we can get by and will get by with less frills and quality and packaging of the various kinds of paper, and we will standardize on our shapes and sizes and grades, but it is unthinkable to ever suggest that tissue and light weight papers as a class are not essential to civilian health and morale and standard of living, even on a war basis, and just as essential to the men and women in the factories, the home and public places on the home front, who are behind the boys on the many and far-flung war fronts.

National Paperboard Association

C. E. Nelson, President

In touching upon today's problem confronting the industry, C. E. Nelson, president of the National Paperboard Association, in his address at the annual meeting of the association, held in New York, November 19-20, said in part:

I wish I had the foresight and the vision to lay out a program which would meet today's situation; that is, the ideal program which would enable us to make the strongest possible contribution to our war effort. This is the most important thing for our country and for our industry, for the present and for the future, and as to this I offer the following comments and suggestions for what they may be worth:

We know our war effort is today being retarded by a scarcity of such important materials as metals and rubber, and even wood.

Paperboard is today proving to be a satisfactory substitute for many of these scarce materials, and it is now in actual use in many fields not heretofore available to our industry. The proof of what can be accomplished by research, following that old saying, "Necessity is the Mother of Invention," are the many fields in which paperboard is now supplanting critical materials.

I hope the paperboard mills will continue to strive to the utmost to develop new products to serve as substitutes for critical materials.

Along this line, I wish to call your attention to a statement which was made at a recent meeting of the Fibre Box Association, by the president of that Association, who said:

"I plead with you that we continue to sow quality, research and constructive development in war-time, with the hope that when peace comes, we shall have the knowledge and the ability to reach and hold markets not heretofore available—and let us strive to see that these 'war-time substitutes' become 'permanent replacements' for the future."

Glassine and Greaseproof Manufacturers Association

R. F. Nelson, President

The Paper Industry is as essential to the War Program as the keystone that supports the arch. Why? For the same reasons that guns, tanks, aeroplanes, boats, motors, food and medicine are essential to war.

Guns are shipped many miles to our far flung battlefields. What insures that the guns are ready for use on arrival? Paper. The special type of paper that keeps the coating of grease on the metal parts and guards against corrosion which would ruin the metal gun parts.

A tank or aeroplane breaks down or is disabled—spare parts are rushed up. Spare parts in perfect condition ready to repair the machine to have it

rolling or winging its way without loss of time. Protective paper has insured no lost time—Grade A metal wrap that packages parts where contact of packaging materials with a critical surface may start corrosion.

Huge plants make ball bearings for other enormous war plants making and assembling machinery for war. There must be no lost time—the bearings must arrive in perfect condition. The bearings are protected by metal wrap Glassine and corrosion, pitting, etc., is prevented.

Coils for motors must be insulated—special Paper is the insulation.

Food—without which man in any branch of the service and the civilian population cannot exist—must have Paper. Food must be consumed quickly or preserved for use when needed. Special papers have always protected food and food products against contamination, spoilage, etc. Now—paper replaces tin, foil, glass—releasing these strategic materials for war. Food is dehydrated, frozen and in other ways prepared to ship in quantity in the least amount of shipping space—and Paper preserves it during the long storage period and delivers it ready for use. The food in ration kits—the food that keeps our boys alive on maneuvers and in battle—must have paper to protect it against the highest and lowest temperatures. The protective Papers developed make it possible to have the best fed army in the world. Not just bully beef and hard tack—our boys, because it is possible to protect foods with paper, have a balanced diet in ration kit form.

Casualties come in to the base hospitals—sterile gauze, band-aids, surgical instruments, medicinal powders—must be on hand ready for use to preserve life. Special sterilization paper keeps these needed articles ready for the emergency.

The purposes of paper are myriad. I have touched lightly on only a few of the indispensable purposes of the type of paper which I know best—the type produced by The Glassine and Greaseproof Branch of the great Paper Industry.

Think about paper—very few minutes in a day pass without each and every one coming in contact with it. Pause a little to think of paper that packages the food you buy, the food for the Armed Forces, the paper you use in numerous ways. Because paper is always at hand performing its function inconspicuously—it is passed over by the non-thinking as a product not vital and essential.

Groundwood Paper Manufacturers Association

E. G. Murray, President

Paper is taken for granted. In the war effort, we think first of steel, aluminum, copper, chemicals, rubber and oil. They are the publicized critical materials. The service of paper is overlooked, but what of the orders, messages, plans, maps, and yes, red tape that must be transmitted? We have no cheaper substitute than paper.

History tells us that during the Revolution, papermakers were sent home from the battlefields because the shortage of paper threatened disaster. Certainly modern warfare which is consuming thousands of tons could not be waged for long without paper.

In this mechanized warfare, paper is playing a new role. Hundreds of substitutes made from paper are relieving metals for more indispensable requirements. Active research has, furthermore, found new uses where paper is actually doing a better job than other materials.

This substitution of paper for materials that can be best put to other uses is also reflected within the industry itself. Simplification and standardization have stretched the supply. New grades using more economical pulps, fewer chemicals, lighter weights, have been introduced. The resultant saving in wood, transportation, manpower, chemicals and maintenance has been accomplished with but slight disturbance to our accustomed civilian necessities while, at the same time, our war requirements have been fulfilled. The greatest danger facing the industry today is that the curtailment program may interfere with paper's contribution to the war effort by making impossible this substitution and evolution within that has just really started and has such tremendous possibilities.

Waterproof Paper Group

Otis Angier, Chairman

Waterproof Papers have gone to War. Prior to Pearl Harbor, the Waterproof Paper Industry was conscious of the part it would be called upon to play in the struggle in which we are all now engaged. This continent knew as well as Europe that one day our number would be "up." When suddenly the sneak attack occurred at Pearl Harbor, the Waterproof Paper Industry was ready for the most part to meet their new responsibilities. As an industry, however, there was one salient factor missing, i.e., we lacked a proper element of coordination of purpose within the industry for the reason that we did not have the assistance or guidance of an able and effective trade association.

Springing, however, as it always has in emergencies of the past, to a quick recognition of its responsibilities it created the Waterproof Paper Group. As a result of the creation of our group, we can, with a degree of pride and at the same time a high sense of our obligations and responsibilities, truly say that Waterproof Papers have gone to war.

Like other divisions of the paper field, we have had out share of dealing with the problem of procurement in connection with critical materials. But because we have learned and are continuing to learn every day the values of sound cooperative effort, we have been able to obtain, for the most part, the critical materials we have required because waterproof papers have not only gone to war, but are in the war both in spirit and in fact.

Examination of the statistics relating to our industry's war effort reveals the fact that as an industry the combined production of all units within the industry amounts to approximately 85.15% in direct war effort (September figures). When we consider the essentiality of paper in the war effort, it is my considered opinion that we may well rest the case of waterproof papers on those vital facts. Why is this?

Well, for example, airplanes, tanks, guns and ammunition must at times be stored in the elements both in transit to the war fronts and after they arrive in some instances. Waterproof papers play an all important part in that connection. If, for example, an intricate piece of mechanism had to be stored for any period of time exposed to the elements without an adequate protective covering, it follows that such mechanism would be rendered useless until reconditioned. Therein is established the fact that water-

proof papers in the particular function described is as important as the device it protects because without this protection the device as above mentioned, would be rendered useless or may perhaps fall into the devastating category of "too late" after reconditioning.

The Waterproof Paper Group go about their assignments and responsibilities inconspicuously and devoid of fanfare. Each unit of production, each man within the association, is grim in dead earnest about the job he has assumed, i.e., to help put down tyranny, wanton murder and disrespect of the rights of others and to stay by that particular job until it has been concluded victoriously.

It seems to me that any further statement I may make would convey little beyond what I have attempted to here indicate on behalf of the Waterproof Paper Group. We have gone to war and shall so remain until victory again permits us to take up our normal peaceful pursuits—but this time, I feel certain we shall have learned enough to realize that to make our branch of the industry a coordinated unit of progress we shall retain the one entity that has meant so much to us in war times—our Waterproof Paper Group, which I have the honor to serve as chairman.

Cardboard Manufacturers Association

MALCOLM B. LOWE, PRESIDENT

The Cardboard Manufacturers Association is primarily interested in cardboard. This includes coated blanks, railroad, photo mount stock, tough check, tag stock and specialties. While these items may not seem as essential as ammunition containers, they are nevertheless serving a purpose of considerable value in the war effort. Cardboard is being substituted for metal signs and license plates. Photo mount stock is used largely in exchange of pictures between families and men in the armed forces. Tough check and tag stock are being substituted for metal in checks and tags. Boxboard is being used in the manufacture of cartons and containers, replacing metal in very substantial volume in the fields of food, tobacco, drugs and pharmaceuticals. And thousands of tons of metal are in this way being released for the war effort. Specialty grades are being made for use as camouflage and also for clothing.

Essentiality is, of course, comparative. But stationery, blueprint paper and other grades are certainly necessary in the prosecution of the war. And the substitution of various grades of paper and particularly board for metal and other critical materials would constitute the paper and board industry as essential to a very large degree.

American Pulp and Paper Mill Superintendents' Association

GROVER KEETH, PRESIDENT

Why I think paper is an essential industry can be answered quite briefly by quoting public statistics to the effect that paper was the sixth industry in the United States in dollar volume before the war started. It is therefore very difficult for me, and perhaps many others, to understand why Washington should consider it about eighteenth in the order of importance to the war effort.

A friend of mine recently remarked that paper was the only industry that was ready when holtilities began, and for this reason we were able to operate without too much assistance from Washington. I am beginning to wonder if he was not correct. Many of us have been trained to get along on what we have and make the best of it, and we have probably functioned in that manner while other industries descended on Washington with a big hue and cry as to how important they were and what all they had to have to keep going. I wish I knew how to get the industry in the position it should be, but I am afraid that I do not.

Salesmen's Association of the Paper Industry

COURTNEY H. REEVES, PRESIDENT

I think it is safe to say that the paper industry is a most essential factor in American economy as represented by the contributions which the industry is making toward the war effort. We do not have to look very far to see the many items that are now being presented to the armed forces for the proper packaging and protection of materials which are to be sent into the most extreme climates of the world. The industry has had less than a year to work and develop these papers and they are now beginning to come off the production lines in volume.

The industry has likewise proven essential in the producing of the tremendous tonnage in the necessary grades to keep the armed forces supplied. It has produced all of the paper necessary for the Government Printing Office and many outside printers for ration books and many other types of government printing which is essential to keeping the civilian population informed on all subjects and the procedures they must follow.

None of this would have been possible without the industry being geared to the highest form of efficiency and the end is not yet. It is my firm belief that the industry will adjust itself to whatever economies the government feels it is necessary to impose upon it and if anything we will become more efficient.

National Paper Trade Association of the United States, Inc.

R. C. KETTLES, JR., PRESIDENT

It goes without saying that no part of our social, economic or civic life and activtiies can be carried on without the use of paper. Communications, contracts, invoices, records, protection for highly essential munitions and arms, the containers for carrying the vast assortment of the various articles necessary to carry on a war, is a large part of what help the paper industry can be to the government in their effort to bring the war to a successful conclusion.

To list the various uses of paper and by-products for the war effort alone would take probably pages and would be rather intricate reading. Beyond the war, certain civilian needs are absolutely necessary not only from a health protection standpoint, but for the successful operation of almost any enterprise. If any one person was designated to determine what was essential and what was not, it is my opinion he would have a most difficult assignment. T.A.P.P.I.'s booklet, "Paper, the Lifeblood of Civilization" is so well named that there is no phrase that has come to my attention that could describe the paper business any better.

Fortunately, supplies of raw material and producing capacity are still sufficient to permit the use of paper in many forms as a substitute for critical materials needed for armaments. The only trouble with the paper industry of the United States is that it is not taking advantage of dramatizing to the people just what various and extraordinary functions

paper performs. It seems a shame that those who are engaged in the sixth industry of the United States have not been able to coordinate as a group all the education necessary to impress the public with the fact that paper is really indispensable. The pulp producers, the manufacturers, the converters and distributors have a great opportunity right now to endeavor to bring all branches of the industry together, and by contact, salesmanship, public relations and education prove to the people that without paper, our war effort will cease, and without paper our civilian economy would collapse.

The Paper and Twine Club

JOHN L. RICHEY, SECRETARY-TREASURER

I believe it would not be far from the truth, if one were to say, that, if over night, all forms of paper and paper products would disappear and could not be replaced, the war would stop almost automatically; the wheels of industry would stop for sometime to come; and the social life of the people would drop to a level where present living standards would no longer exist. Culture, in any but the most elementary sense would no longer exist and life, in all forms, would drop back below the standards of the Middle Ages.

If one stops to think of the part Paper plays in every phase of life today, this statement is not farfetched.

Paper in one form or another permits the dissemination of information in the form of newspapers, magazines, books, pamphlets and other printed matter. Without it, education could be only a matter of conveying intelligence by word of mouth. Spoilage of merchandise of all sorts would increase because of lack of proper packaging. Many of the most important sanitary instruments could not function without paper in some form or another. The elimination of paper as a substitute for metal, wood, glass, etc. would throw such a burden, by way of demand, upon those commodities that they could not be supplied for sometime to come. Even building materials, now made of board on some mastic or plastic form are important factors in that field.

Failure of the paper industry and trade to properly tell its story to consumers of all classes and particularly to the United States Government in war times has resulted in a failure on the part of most people to appreciate the vitally essential character of paper and paper products in the general scheme of living and in the prosecution of the war. Much could be done by the industry and trade, through an intelligently planned and administrated program of public relations in order that the industry might be given proper recognition by every man, woman and child in the United States.

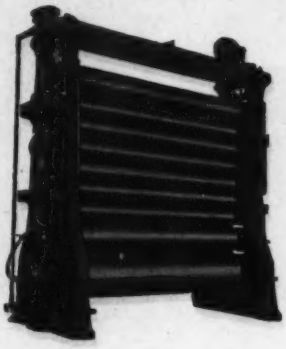
Riegel Paper Corp. Changes

A. W. Lamb, production engineer for the Warren, Hughesville and Riegelsville Mills of the Riegel Paper Corporation is retiring as of January 1, 1943. Mr. Lamb's duties will be taken over by F. I. Jacoby who has been mill superintendent at the Milford plant. Mr. Jacoby will have the title of assistant general superintendent and his duties will take him to the Warren, Hughesville, Riegelsville and Milford Mills, also the finishing, converting and coating departments of the Milford Mill.

G. Lamont Bidwell succeeds Mr. Jacoby as superintendent of the mill department of the Milford Mill.

LOBDELL

Choice of the Leading Paper Mills

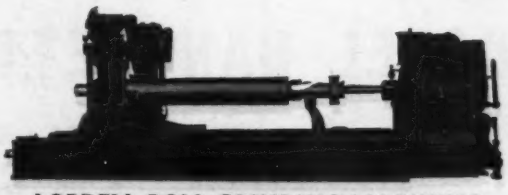


LOBDELL CALENDER STACKS

are accurate, durable and easily operated. Roll lifts, controlled from the floor, may be operated by electric motor, hydraulic pressure or hand ratchet. Up-to-minute automatic lubrication or anti-friction bearings as service indicates.

LOBDELL MICROMETER ROLL CALIPER

Indispensable in keeping check on condition of rolls. Extremely accurate, light in weight and easily adjusted to varying roll diameters 7" to 30", 8" to 36" and 9" to 42".



LOBDELL ROLL GRINDING MACHINES

are the "last word" in roll grinding. They are compact, convenient and accurate and embody three exclusively Lobdell features. 1. The automatic crowning device, no gears, cams or formers to change, one simple setting of micrometer scale to table for any predetermined crown. 2. Provision for maintaining perfect alignment of bed. 3. V-Belt wheel drive with increased power, rigidity and convenience.

LOBDELL PURALOY ROLLS are made of an exclusive, LOBDELL developed alloy having extra hardness and corrosion resistance to meet the extra severe service of water finish, etc. "PURALOY" ROLLS are NOT AVAILABLE for the duration of the war.

LOBDELL

COMPANY

107 Years in Business

WILMINGTON • DELAWARE

Superintendents Meet at Kalamazoo

The Michigan Division of the American Pulp and Paper Mill Superintendents Association, held its November meeting at the Park American Hotel, Kalamazoo, Mich., on November 19. Chairman Al. Perlick, being absent on a deer hunting trip, 1st vice-chairman, Glen Sutton presided.

Ray L. Barton, 2nd vice-president of the National Association gave an account of his recent visit to the Connecticut Valley Division's meeting in Norwich and expressed his pleasure at his reception there. As yet, no definite announcement could be made on the program for the December meeting, due to a disappointment. The committee on the joint superintendents Association and TAPPI, meeting on January 7, 1943, making satisfactory progress on plans and program.

C. A. Skog, general freight agent of the Grand Trunk Railroad, was the speaker and his general topic was traffic problems encountered by railroads in transportation of vital war materials and troops in war times. The first part of his talk was a comprehensive history of railroads dating back to 1803 in England, followed by the high spots in rail and canal transportation in the early days of our Union. The efforts of Col. Stephens, whom he credited as the father of American railroads, was explained in detail.

The speaker said that U. S. railroads in World War II are doing a better job than in 1918, despite there are fewer locomotives and cars. The improved road beds, rails laid on treplates, increased car capacity loading and increased locomotive power, offsetting the difference.

The rise of Diesel-powered units and lighter equipment are also a factor. Mr. Skog stated that the railroads had moved approximately seven million soldiers since December 7, 1941.

His account of the stupendous work of transporting gasoline and fuel oil across the continent by rail, made necessary by the submarine boat menace, was impressive. He commended the all-out cooperation of industry with the railroads in their job of moving equipment and expected some complications in the enormous passenger traffic, which will ensue when the soldiers are granted holiday furloughs. He paid a tribute to Sir Henry Thornton's administration of the Canadian railroad systems. He also discussed pipe line projects and the transferring of Greater Lake cargo boats down the Mississippi River to the Gulf of Mexico. On the whole a very instructive and informative talk on all phases of transportation was presented.

Williamson Co. To Liquidate

The Williamson Pulp and Paper Company, Austin, Pa., has decided not to resume operations and it is stated that the business will be liquidated. Recent floods destroyed the railroad leading to the plant and because of present conditions, this cannot be rebuilt. Because of this and other obstacles to its plans which the company was encountering, it was deemed expedient to close up the business.

COVEL HANCHETT KNIFE GRINDERS

AK TRAVELING
WHEEL KNIFE GRINDER

Our production covers the popular AK traveling wheel type and the equally popular traveling carriage type . . . Our engineers will gladly help you select the type best suited to your own conditions.

A TYPE
FOR EVERY
OPERATING CONDITION

GK TRAVELING
CARRIAGE KNIFE GRINDER

COVEL HANCHETT CO.

BIG RAPIDS, MICH. PORTLAND, ORE.

Obituary

John C. Duncan

John C. Duncan, retired paper maker, died November 21 at his home in Mechanicville, N. Y., in his 84th year after an illness of several years.

His father was Thomas Duncan, general manager of The Duncan Company, owners of pulp and paper mills at Mechanicville, N. Y. Upon the death of the elder Duncan, John succeeded him as general manager, and continued as such until May 1, 1904 when The Duncan Company was absorbed by West Virginia Pulp and Paper Company.

At the time of this merger, Mr. Duncan retired

JOHN C. DUNCAN

from active participation in the paper industry and traveled extensively for many years. During the past ten years he has lived in comparative retirement at his Mechanicville home. He continued to serve as a Director of West Virginia Pulp and Paper Company until his death.

He was born in Greenville, Conn., later moving to Poquanock, Conn., where his father had a paper mill. He attended school at Amherst, Mass., for several years and was graduated from the Eastman School of Business, Poughkeepsie, in 1877.

Mr. Duncan worked in the paper mill in Poquanock until 1880 and from there went to Holyoke, Mass. He then became superintendent of the Castleton paper mill for a short time. When Mr. Duncan and his father acquired the small pulp mill at Mechanicville in 1886 it became known as the Duncan Company and remained so until it was consolidated with the West Virginia Pulp and Paper Company in 1904.

In 1890 he married Anor Collamer of Malta, who died in 1923. In 1926 he married Minnie Moore, who survives. He leaves also a son, John C. Duncan Jr. of New York, and three grandsons.

W. Gardner Very

W. Gardner Very, 50, a New England representative of Hollingsworth & Whitney Co., died very suddenly at his home in Norwood, Mass., Friday morning, November 20. Mr. Very was at the Fall

ASPHALT SPECIALTIES FOR *PROMPT DELIVERY*

If you are having trouble obtaining asphalt specialties for use in paper production, let Wishnick-Tumpeer, Inc. meet your needs.

Our two modern, strategically located refineries are producing at full capacity to meet vital war demands, but we have the extra facilities to fill your orders also.

In addition to a complete line of asphalt specialties for use in waterproofing, saturating, laminating and coating paper and paper products, we can also make immediate delivery on a wide variety of asphalt compounds especially produced to the specifications of individual paper manufacturers.

These are all PIONEER Asphalts, famous for their quality for nearly half a century. They are produced by the most modern methods from materials selected and tested for basic inherent qualities and their adaptability to specific industrial uses. In addition to the cooperation of our experienced service staff, we offer you the facilities of our up-to-the-minute research and product development laboratory. Write, phone or wire today.

WISHNICK - TUMPEER, INC.

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New York, 295 Madison Avenue • Boston, 141 Milk Street • Chicago, Tribune Tower • Cleveland, 616 St. Clair Avenue, N. E. • Witco Affiliates: Witco Oil & Gas Company • The Pioneer Asphalt Company • Panhandle Carbon Company • Foreign Office, London, England

TWO VALUABLE AIDS FOR THE PAPER MANUFACTURER

●

K-121-B DEINKING — DECOLORIZING

K-121-B is being used by paper manufacturers for various purposes. Because of its wetting and penetrating powers, this chemical lends itself to diversified uses. It is used with Lime and Caustic for decolorizing rag stocks. It prevents excessive redepositing of dye, or color, and by its buffer action, prevents degradation of fiber. The treated, or cooked stock washes out more readily. The bleach demand is reduced.

K-121-B has aided paper manufacturers in their deinking processes. Its ability to hold in suspension the pigments removed by alkalies insures a cleaner stock. Its penetrating qualities make the alkalies more effective in their work of ink removal.

K-140

When K-121-B is used on papers containing 3% or less ground wood, it will, in many instances, eliminate the need for bleach.

K-140 is especially designed for use in deinking ground wood paper stock. K-140 used in connection with caustic prevents yellowing and the finished pulp approximates the color of new ground wood.

●

THE KINSLEY CHEMICAL COMPANY

12500 Berea Road

CLEVELAND, OHIO

Dinner of the Boston Paper Trade Association Wednesday evening, and on Thursday was travelling in Fall River and New Bedford, calling on the trade, but passed away of a heart attack the next day.

He had been with Hollingsworth & Whitney Company for 25 years, entering the employ of the firm in the cost department after he had attended the Worcester Polytechnic Institute. Later he became a salesman for the company.

Well known in New England, Mr. Very was of an attractive personality and was highly regarded by the trade and others. He was a member of the Boston Paper Trade Association and the American Legion and was a Past-master of Norwood Lodge of Masons.

His wife, Mrs. Rachel (Winslow) Very, and a son Robert, a student at Phillips Exeter Academy, are living.

A number from the Boston Paper Trade Association, whose members sent a floral tribute, attended the funeral services, held Sunday afternoon, November 22, at his late residence, 14 Walter road, Norwood.

New List of American Standards

The American Standards Association today announced the publication of its newest List of American Standards for 1942.

More than 550 American Standards are listed, of which 71 represent new and revised standards approved since the last (February 1942) issue of the list. These are marked with an asterisk.

There is a separate heading for American War Standards—standards developed specifically for the war effort.

Another section is devoted to American Safety Standards, which are also of great importance to the war effort in connection with the President's program for the conservation of manpower.

Other standards include definitions of technical terms, specifications for metals and other materials, methods of test for the finished product, dimensions, etc. They reach into every important engineering field and serve as a basis for many municipal, state and Federal regulations. This particular List of Standards will serve as a useful reference piece to the engineering and purchasing departments of many manufacturing firms.

Standards have assumed a vital role today in connection with the war effort. Every Government order is based on specifications and standards are further used in industry in simplifying the production problem, conserving materials, pegging quality to price control, in inspection, and in contracting and subcontracting. A large part of ASA's work is now on war-time jobs requested by Army, Navy, WPB, OPA and industry. In fact, the ASA is under contract with the Federal Government to carry on an increasing amount of such work.

In each case, the standards approved by the ASA represent general agreement on the part of maker, seller, and user groups as to the best current industrial practice. More than 600 organizations are taking part in this work.

This List of American Standards for 1942 will be sent free of charge to anyone writing in for it. Requests should be addressed to the American Standards Association, 29 West 39th street, New York, N. Y.

New Customs Court Cases

New cases in the United States Customs Court as reported by the Import Committee of the American Paper Industry include the following: One shipment of Japanese tissue paper coffee filter discs, classified as paper cut into shape at 30 percent, claimed by importer to be dutiable at the rate lower in this instance, of 5 cents per pound and 15 percent, which, under the Canadian Reciprocal Trade Agreement, was reduced to 2½ cents per pound and 7½ percent.

One shipment of Japanese tissue paper discs, classified at 6 cents per pound and 20 percent, claimed by the importer to be dutiable at 5 cents per pound and 15 percent, and under the Canadian Reciprocal Trade Agreement at 2½ cents per pound and 7½ percent.

Two shipments of Japanese tissue paper in rolls, classified at 6 cents per pound and 20 percent, claimed by the importer to be dutiable as in the above two cases.

So-called "Wing Mail" tissue, imported from England in weights of 4½ pounds per ream, 20x30-480, classified for duty as tissue paper at 6 cents per pound and 20 percent, claimed by importer to be dutiable as filter paper at 5 cents per pound and 15 percent, and also under the Canadian agreement at 50 percent reduction from the rate on tissue paper.

Demand More Active

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., November 23, 1942 — Action of the government toward curtailing production in some items in the paper trade is causing much concern here. This doubtless is the cause of a rather active buying spree indulged in during the last week. Both manufacturers of boxes and the wholesale trade are attempting to build up stock reserves and are having a rather sorry time of it. Prices are nearly all at ceiling levels and the local trade is watching each government move with the old eagle eye. Due to the general pulp and ground wood situation, the demand for krafts, newsprint and sulphites showed gains last week over the averages of the last few months. This demand likely will continue and perhaps will be limited only by available supplies.

Fine paper demand followed the general trend last week with demand for books, covers and ledgers good and prices firm. Many of the larger local printers have a fair backlog of government work and for this they are receiving priorities. One large local company is working two 12-hour shifts each day and is hard put to it to find men qualified to handle the business. The pool of printers, pressmen and binders locally is a mere puddle.

Tissues moved well last week with strong prices. Paper bag and wrapping paper was in good demand with indications of further strength as the retail index here rises somewhat each week.

Building paper and roofing continued slow, as has been the case ever since the government prohibited the construction of houses costing more than $6,000. The level of demand is expected to drop further as severe weather arrives.

Little activity was seen last week in the paper stock field. Local warehouses have large inventories and such mill buying as was done was confined to a few grades with prices generally weak. Better grades of rags were wanted in some quarters, but the general mill demand for rags is none too good.

For the MODERN BAG PLANT
⅛ Bbl. Combination for Valve and Satchel Bottom Bags 16" to 24" wide, 22" to 40" long.
Patented Photo-electric Side Register for guiding traveling web.
Intucked Multi-wall Tuber for Sewed Valve Bags.
One or two wall Side Seam Tuber with Cross Pasters and Side Register Control.
Heavy Duty Multi-wall Tuber, built in cross pasters and automatic compensator.
Pressor Conveyer for Bottomers making multi-wall pasted bottoms.
Combination Bottomer for pasted bags 17½" to 28" wide, 22" to 60" long, 2½" to 9" wide bottoms.
500 Tubes per minute, double cut-off, center or side seam, right angle delivery.
A full line of smaller sizes Tubers and Bottomers — Flat and Square Bag Machines. Also manufacturers of Paper Mill Machinery, Cylinder and Fourdrinier — Jordans — Pumps — Rotary Cutters — The Famous "UNDERCUT" Paper Trimmer.
1828
The SMITH & WINCHESTER Manufacturing Company
SOUTH WINDHAM
CONNECTICUT

Form Waste Paper Committee

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1942—Formation of a Waste Paper Consumers Industry Advisory Committee has been announced by WPB, Division of Industry Advisory Committees. David Graham, Administrator of Orders M-93 and M-251, and Chief of the Pulp Section, Pulp and Paper Division, is the Government presiding officer.

Committee members are: Dexter D. Coffin, C. H. Dexter & Son, Inc., Windsor Locks, Conn.; G. K. Ferguson, Watervliet Paper Company, Watervliet, Mich.; Lloyd A. Fry, Volney Felt Mills, Chicago, Ill.; C. W. Gallup, New York and Pennsylvania Company, New York; N. F. Greenway, Robert Gair Company, New York; D. H. Patterson, Fibreboard Products, Inc., San Francisco, Cal.; H. C. Reid, American Writing Paper Corporation, Holyoke, Mass.; Robert R. Richardson Company, Middletown, Ohio; John P. Sanger, U. S. Gypsum Company, Chicago, Ill.; H. Schmidt, Schmidt & Ault Company, York, Pa.; and J. C. Twinan, O. B. Andrews Paper Company, Chattanooga, Tenn.

Paper Underwear!

The Riegel Paper Corporation, Riegelsville, N. J., is experimenting in the production of paper underwear, suitable for service for the armed forces. The proposed garments, it is said, would insure warmth in any unusually cold climate. Up to the present time, no regular output has been established, the articles made being for research and further investigations.

H. K. Porter Expand Line

In order to best serve the process trade during this emergency, H. K. Porter Company, Inc., 5070 Harrison Street, Pittsburgh, Pa., have added to their process equipment line agitated wood tanks made from cypress, redwood, long leaf yellow pine, fir, oak, and poplar and equipped with Porter better built agitators.

PORTER AGITATED WOOD TANKS

Wood tanks for the storage of water, oil, chemicals, and various solutions for pickling processing, vinegar generating and many other purposes may be obtained in all shapes and sizes, including cylindrical, rectangular, elliptical, up to 100,000 gallons capacity.

Stop those "PUMPING-TROUBLE" delays with the R & M MOYNO

ONLY TWO PUMPING PARTS

Here's the patented secret of the efficient, trouble-free performance of the R & M Moyno Pump. A helical rotor revolves within a helical-threaded stator, providing pumping action like that of a piston moving through a cylinder of infinite length. Construction of the Moyno Pump is so simple that it can be dismantled and reassembled in 30 minutes.

Dozens of leading paper mills depend on the R & M Moyno for efficient, trouble-free pumping. Actual service records everywhere show cost savings and improved product quality.

With today's demands for all-out production of paper, you can't afford "pumping-trouble" delays in your mill.

Here's the pump that can "take it"—the new R & M Moyno. It's radically different, yet simple in principle . . . handles size, coating or stock without foaming, turbulence or cavitation . . . helps speed your production and improve your product quality.

Keep your mill free from "pumping-trouble" delays, save time and costly maintenance with the R & M Moyno. Write today for Folder No. 1777.

ROBBINS & MYERS • Inc.

MOYNO PUMP DIVISION SPRINGFIELD, OHIO

HOISTS • CRANES • MOTORS • FANS • FOUNDED 1878

Stability of Papers

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1942—As a result of WPB's General Limitation Order L-11, restricting the use of chlorine in bleaching paper pulp, the Bureau of Standards, in cooperation with the Fine Paper Unit of the Board, has investigated the effect of the order on the stability of papers.

The Fine Paper Unit obtained for the investigation 24 samples of bond papers consisting of 25, 50, and 75 percent rag fibers, the balance being sulphite wood fibers. The papers from each manufacturer were comparable with respect to bleached and unbleached sulphite, and to machine drying, that is, drying on steam heated cylinders, and to air drying. Included also were a few samples of book and postal card paper containing unbleached fibers and a sample of bond paper composed entirely of unbleached sulphite fibers.

All of the samples were subjected to accelerated aging consisting of exposure to dry air at 100° C. for 72 hours; and some to irradiation by carbon-arc light for 40 hours, 20 hours on each side. The amount of deterioration was determined by finding the loss in folding endurance and in alpha cellulose.

Under the heat test, the paper containing the unbleached fibers compared favorable in stability with those containing bleached fibers, but the opposite was true under the light test. When irradiated, the folding endurance and the alpha cellulose of the papers containing unbleached fibers decreased very much more than those composed entirely of bleached fibers and the former also became much more discolored. On subjecting the irradiated papers to the heat test, most of them lost practically all of their folding endurance. This effect of light is to be expected as unbleached fibers contain appreciable amounts of lignin which is very light sensitive as witness the yellowing and weakening of newsprint paper, which contains very large amounts of lignin, on exposure to light.

As is to be expected, the appearance of the papers containing unbleached fibers was impaired with respect to color and dirt content.

The manner of drying the papers had no appreciable effect on the stability of them whether they contained unbleached fibers or not, but in general the air-dried papers of both types had the better folding endurance.

WHAT YOU SHOULD KNOW ABOUT PIPE HANGERS!

There is no place for guesswork in the selection of Pipe Hangers. The following excerpts from the American Standards Association Code for Pressure Piping give time-proved guidance to correct procedure.

MALLEABLE IRON CASTINGS may be used for pipe clamps, beam clamps, hanger flanges, clips and bases, swivel rings and similar parts of pipe supports, but their use shall be limited to such cases where the operating temperature of the pipe line will not be in excess of 450°F.

STEEL or WROUGHT IRON can be used throughout for hanger rods, turnbuckles, beam clamps, pipe clamps, supports, rollers, guides and bases.

GRINNELL offers an ENGINEERED PIPE HANGER

for each specific service . . .

MALLEABLE IRON ADJUSTABLE SWIVEL RING (Split Ring Type) – Underwriters Approved – Patented. Can be used with coach screw rod or machine threaded rod with practically any type of ceiling flange, expansion case, or insert. Swivel shank allows adjustment. No temporary support of pipe line is needed while making adjustments. Swivel shank locks automatically when pipe is in desired position. The hinging of the ring is off center, providing sufficient seating to hold the pipe before closing the ring.

WROUGHT STEEL ADJUSTABLE PIPE CLAMP – Underwriters Approved. Consists of two half-bands bolted together with Weldless Eye Nut and Bolt. When used with U.F.S. I-Beam Clamp with Weldless Eye Nut, provides for at least 3 inches of horizontal pipe movement in any direction per foot of hanger rod length.

For complete details, write for catalog of Grinnell Adjustable Pipe Hangers and Supports. Grinnell Company, Inc., Executive Offices, Providence, R. I. Branch offices in principal cities of United States and Canada.

GRINNELL

WHENEVER **PIPING** IS INVOLVED

U. S. Paper Award

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1942—The Government Printing Office announced the following awards for paper: Zabel Brothers will furnish 20,035 pounds of white offset book paper at $7.80 cwt.; Cauthorne Paper Company will furnish 8,756 pounds of 25% rag white ledger paper at 12.13 cents per pound; Marquette Paper Corporation will furnish 525,500 pounds of chemical wood manila paper at 4.675 cents per pound; The Baxter Paper Company will furnish 450,000 pounds of telephone book new paper at $4.63 per cwt.; R. P. Andrews Paper Company will furnish 103,455 pounds of white sulphite writing paper at $5.87 per cwt.; and Old Dominion Paper Company will furnish 109,335 pounds of yellow sulphite writing paper at 6.489 cents per pound.

Baldwin Paper Company, Inc., will furnish 7,200 pounds of yellow sulphite manifold paper at 8½ cents per pound; Mudge Paper Company will furnish 38,400 pounds of 25% buff ledger paper at 10.44 cents per pound; R. P. Andrews Paper Company will furnish 40,000 pounds of tan bristol paper at 10.7 cents per pound; R. P. Andrews Paper Company will furnish 8,822 pounds of non-soluble and wet-rub resistant 50% rag waterproof index paper at 18.3 cents per pound; Barton, Duer, & Koch Paper Company will furnish 13,749 pounds of white sulphite writing paper at 5.97 cents per pound; Barton, Duer & Koch Paper Company will furnish 108,780 pounds of white sulphite writing paper at 5.72 cents per pound; R. P. Andrews Paper Company will furnish 100,000 pounds of white sulphite writing paper at 5.47 cents per pound; Aetna Paper Company will furnish 27,876 pounds of white sulphite paper for 8.68 cents per pound.

Mudge Paper Company will furnish 16,300 pounds of 25% rag buff ledger paper at 10.43 cents per pound; Eastern Corporation will furnish 3,010,000 sheets of buff sulphite writing paper at 6.37 cents per pound; R. P. Andrews Paper Company will furnish 272,000 sheets of white sulphite writing paper at 5.87 cents per pound; the same company will furnish 6,050,000 sheets of white sulphite writing paper at 5.87 cents per pound; and also 1,300,000 sheets of white sulphite writing paper at 5.87 cents per pound.

Wilcox-Walter Furlong Paper Company will furnish 15,434 pounds of 25% rag white ledger paper at 15 cents per pound; Marquette Paper Corporation will furnish 16,800 pounds of chemical wood cover paper at 9.25 cents per pound; Wilcox-Walter Furlong will furnish 32,723 pounds of 25% rag yellow bond paper at 12 cents per pound; Bulkley, Dunton & Co. will furnish 10,908 pounds of 25% rag yellow bond paper at $13.20 per cwt.; the latter company will also furnish 14,432 pounds of 25% rag white bond paper at 12.4 cents per pound; Wilcox-Walter Furlong will furnish 25,712 pounds of 25% rag yellow bond paper at $12.00 per cwt.

R. P. Andrews Paper Company will furnish 124,800 pounds of white offset book paper at 6.28 cents per pound; Aetna Paper Company will furnish 28,581 pounds of 50% rag white ledger paper at 13.35 cents per pound; R. P. Andrews Paper Company will furnish 69,608 pounds of white offset paper at $6.84 per cwt.; the latter company will also furnish 22,350 pounds of offset book paper at $6.02 per cwt.; and 300,000 pounds of machine finish book paper at 5.61 cents per pound; Barton, Duer & Koch Paper Company will furnish 300,000 pounds of white sulphite writing paper at 5.61 cents per pound; Walker-Goulard-Plehn Co. will furnish 96,000 pounds of 25% rag white ledger paper at 9.796 cents per pound; Gilbert Paper Company will furnish 311 pounds of arrow head safety writing paper at 17 cents per pound; Cauthorne Paper Company will furnish 24,288 pounds of white sulphite writing paper at 6.73 cents per pound.

Perkins-Goodwin Company will furnish 40,000 pounds of white sulphite ledger paper at 6.75 cents per pound, and also 120,000 pounds of white sulphite ledger paper at 6.75 cents per pound; Walker-Goulard Plehn Company will furnish 122,340 pounds of white sulphite writing paper at $6.97 cents per pound; Bermingham & Prosser Paper Company will furnish 40,000 pounds of pink sulphite bond paper at 6.58 cents per pound; the latter will also furnish 40,000 pounds of salmon sulphite bond paper at 6.58 cents per pound; Barton, Duer & Koch Paper Company will furnish 366,950 pounds of white sulphite paper at 6.11 cents per pound.

"Reduces "Time Out"

Stebbins "knowledge" gained through fifty-eight years of designing, installing and servicing acid and corrosion-resistant linings in pulp and paper mills assures a trouble-free installation.

There is a Stebbins Quality Lining for every lineable tank or vessel.

SEMCO

Stebbins Engineering and Manufacturing Company

370 EASTERN BLVD. WATERTOWN, N. Y.

A New Resin Plastic

Plastic compositions which can replace steel or other metals in many uses may now be manufactured by incorporating with various cellulosic fibers a resin powder known as Vinsol, extracted by Hercules Powder Company chemists from the Southern pine tree, the Patent and Licensing Corporation of New York, has announced.

This new structural resin plastic is an addition to the growing family of resin-treated laminated paper products. It is a thermoplastic, fibrous-resin composition, hard, dense, stiff but with reasonable toughness. It is described as sturdy but lightweight, and has low water absorption.

It is said to be a possible replacement for steel or other scarce metals for some parts in containers for food shipments; for automobile license plates; in trucks, street cars and busses; conduits in certain uses; cement-filled Lally columns supporting light loads. One of its best characteristics is its high resistance to petroleum products.

Fibers used in the production process include newsprint, clean cotton rags, sulphite, sulphate, and the like, in straight or mixed furnish. Such fibers are non-critical. The Vinsol resin is currently available without priorities, and can be obtained in ample quantities from the Hercules naval stores plants at Brunswick, Ga., and Hattiesburg, Miss.

When it is held advisable in certain operations to raise the fluxing or melting point of Vinsol, hardening agents are employed, and the report recommends zinc oxide.

Production of the fiber sheets requires use of existing conventional paper-making machinery, without special installations. Thin sheets for laminating may be made by continuous process on cylinder of fourdrinier paper machines. Thicker sheets for laminating or for homogeneous pressing can be made on wet machines or insulation board machines. So far, the source of supply has been, chiefly, The Flintkote Company, New York, of whom The Patent and Licensing Corporation is a subsidiary.

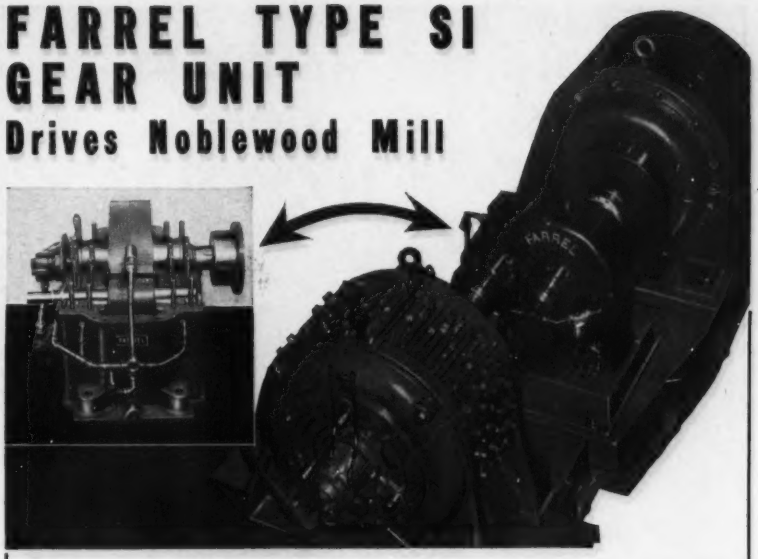
Nashua Plant Burned

NASHUA, N. H., November 23, 1942.—Damage by fire estimated at $50,000 to the big warehouse of the Nashua Gummed & Coated Paper Company November 17 was believed to have started from a workman's acetylene torch. Tons of tapioca flour imported from Java and no longer available were destroyed, together with several carloads of wax and tons of paper.

A few months ago, the building was swept by fire with a loss of some $15,000. Workmen were engaged the day of the fire in replacing some of the steel girders twisted in the first fire.

Firemen were on duty more than six hours before the fire was under control. The entire roof of a one-story concrete building fell in and two of the sidewalls caved in.

FARREL TYPE SI GEAR UNIT
Drives Noblewood Mill



Working 24 hours daily in continuous operation, this Noblewood Mill converts 20 to 35 tons of formerly wasted wood material into fine fibrous pulp suitable for the manufacture of newsprint paper, saving approximately 1,000 acres of spruce forests per annum from cutting.

This high speed refiner, built by the Noble & Wood Machine Company, Hoosick Falls, New York, is driven at 1,800 RPM through a Farrel Type SI speed increasing gear unit by an 800 HP, 1200 RPM synchronous motor.

The Farrel Type SI gear unit used for this Noblewood Mill is a typical application where the high peripheral speeds encountered in speed increasing service present problems of design and construction which can be answered only by specialized engineering skill, experience and manufacturing facilities.

Hundreds of installations in varying types of service have proved Farrel Type SI gear units to be outstanding examples of gear engineering and precision workmanship. They are smooth, quiet and efficient in operation, and rugged and reliable under exacting conditions of continuous 24-hour duty.

Write for Bulletin No. SI-438 for detailed description, tables of sizes and ratings and complete specifications.

FARREL DRIVES *for* VICTORY

FARREL-BIRMINGHAM COMPANY, INC.
344 VULCAN ST. BUFFALO, N. Y.
The Gear with FARREL *a Backbone*

N. E. Paper Men to Meet

BOSTON, Mass., November 23, 1942.—Harry J. Dowd of the H. J. Dowd Company, Cambridge, and president of the New England Paper Merchants Association, announces a general meeting of the association to be held at the Hotel Touraine, December 3 to discuss the effect of recent government regulations on New England Paper Merchants. A meeting of the directors will be held at 11:45 followed by a luncheon at 12:45.

SOLD FOR HANDLING 6% SULPHITE STOCK . . . HANDLES 9%!

According to repeated tests at a Middle Western mill this is exactly what is being accomplished by a Warren Stock Pump, Type 8-SOD-17. Such performance, while not guaranteed, is typical of that extra PLUS that is engineered into every Warren Pump which makes it possible for them to handle the toughest job in your mill . . . and with a minimum of upkeep and shutdowns. Warren Pumps are built to meet specific requirements . . . requirements that do not differ, basically at least, from yours.

Warren Stock Pump Bulletins go into further details and are yours for the asking; also Warren Engineering Service is at your disposal.

WARREN PUMPS

Warren Steam Pump Company, Inc., Warren, Massachusetts

Ohio TAPPI Meets

The Ohio Section of the Technical Association of the Pulp and Paper Industry and the Miami Valley Superintendents' Association held a joint meeting at the Manchester Hotel in Middletown, Ohio, on Saturday November 14, 1942. Following a dinner served to 78 people, Carl Roess, chairman of the Ohio Section of TAPPI presided at a brief business meeting.

Mr. Roess then asked S. R. Olsen of the Champion Paper and Fiber Company to introduce Grover Keeth, national president of the Superintendents' Association. Mr. Keeth spoke for a few minutes to the group and then Mr. Olsen presented H. H. Harrison and F. L. Zellers past presidents of the Superintendents' Association. He next presented Earl Grant of the Crystal Tissue Company.

Mr. Roess then introduced T. E. Knapp of the Champion Paper and Fiber Company who talked about the role which war gases played in the first World War and the possibility of their use in the present conflict. He stressed the importance of educating the people of the country concerning the possibilities and the limitations of war gases. He described some of the more common materials which might be used against civilians along with their properties, their effects and first aid treatments that should be used. He also described some of the decontamination procedures that could be used to remove the persistent type of gases. Mr. Olsen then presented H. H. Latimer of the Champion Paper and Fiber Company who led a round table discussion on the employment of women in the paper industry. A. S. Anderson, personnel director of Champion described some of the problems which the employment of women in paper mills bring about. This part of the discussion was followed by a talk by R. H. G. Smith of the Sorg Paper Company who describe their employment of women in various capacities in Sorg's Pulp Mill in British Columbia. Kenneth Faist of Champion then told about the methods his organization used in selecting women for the various jobs in the paper mill. This was followed by Arthur Thurn's description of the use of women as control testers in the paper mill. Following a very interesting discussion, the meeting was adjurned.

The following men were in attendance:

R. H. G. Smith, G. H. Suhs and D. M. Yost, Sorg Paper Company; M. L. Barker, Emil Beserdick, John Burnett, Val Friedrich Jr., Edward Lum, William Reigers and R. K. Stevenson, Beckett Paper Company; C. Ray Boggs, Duncan Brown, Thage Dahlgren, Harry C. Fisher and George Skillman, Gardner-Richardson Company; A. S. Anderson, R. L. Betts, P. Blickensderfer, Warren J. Current, E. Ebie, Kenneth Faist, J. A. Hoerner, L. L. Hopkins, Kenneth Jackson, Albert S. Kind, T. E. Knapp, Homer H. Latimer, C. L. McKasson, H. R. Murdock, J. S. Neely, S. R. Olsen, M. J. Piggatt, James Rice, J. R. Simpson, Frank Thompson, Arthur Thurn, Edgar Turnbull and H. E. Wright, Champion Paper and Fiber Company.

Howard Buechler, P. J. Jerardi, W. W. Macklem and R. T. Petrie, Black-Clawson Company; T. Agronin, John Hamm and O. W. Hein, Shartle Brothers Machine Company; K. W. Osborne and A. J. Tuccinardi, Ohio Boxboard Company; C. R. Faulkender and C. K. Textor,

Bauer Brothers; A. G. Stone and O. H. Martin, International Envelope Company; Donald Appleton and H. P. Petzold, Oxford-Miami Paper Company; John E. Burdsall, Earl E. Grant and Howard H. Harrison, Crystal Tissue Company; C. Bustle and Lowell Haworth, Fox Paper Company; H. A. Brawn and A. Randall, Miamisburg Paper Company; Fred S. Crysler, J. L. Dwyer and A. G. Wilson, Container Corporation; F. L. Zellers, Chillicothe Paper Company; Arthur Kjellstrand, Ault & Wiborg Carbon and Ribbon, Inc.; Henry Waffenschmidt, National Aniline; Robert R. Weber, Mathieson Alkali Works; O. P. Gephart, B. F. Goodrich Company; Myron Wittmer, Cheney Pulp and Paper Company; Leo Wall, City of Miamisburg; T. B. Janvrin, The Bristol Company; S. J. Wheelen, Schuler & Benninghofen; Carl D. Roess, Wrenn Paper Company; W. C. Slattery, Sinclair Company; Willard I. Upson, Analytical Chemists of Cincinnati; Phil S. Cade, Harding-Jones Paper Company; Harold G. Macklem, Florida Pulp and Paper Company; Grover Keeth, Marathon Paper Mills.

Boston Paper Men Meet

BOSTON, Mass., November 23, 1942.—The war theme and patriotism were uppermost at the fall meeting of the Boston Paper Trade Association held at the Harvard Club of Boston Wednesday evening, November 18th. President Irving N. Esleeck was in the chair with 154 members and guests attending. It was brought out that the organization was doing all that it could to render service to service men.

Three new members were elected: Paul M. Jones, Storrs & Bement Company, and L. Gordon Glazier, Hollingsworth & Whitney Company, to regular membership, and John W. O'Connor, Fitchburg Paper Company, limited membership.

Matthew O. Byrne, chairman of the Key Kollection Kampaign Committee, extended appreciation for the wonderful cooperation of the trade in the work, giving an estimate of 190,000 pounds of keys which had been contributed.

Bill Cunningham, the widely known feature writer and columnist, of the *Boston Herald*, gave an inspiring and dramatic talk on "Our Country at War," which held the close attention of his audience until the end.

The evening closed with the singing of "The Star Spangled Banner."

There is no shortage **of paper or pulpwood. As long as gasoline and tires are available, the supplies will continue to come out of the woods by motor truck. After that you can still rely upon the faithful mule, in the Southern States.**

The picture shown was snapped on privately owned land of the Southern Kraft Corporation in the vicinity of Georgetown, S. C.

Widest paper machine in South Carolina, 242 inches — narrowest, 96 inches — *Draper* can fit felts to any dimension.

Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856 CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

L. H. BREYFOGLE, Kalamazoo, Mich.
C. K. BEECHER, Delaware, Ohio
W. L. CAMPBELL, Savannah, Ga.
RALPH E. BRIGGS, Canton, Mass.
O. J. LELOFF, Vancouver, Wash.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 115 November 26, 1942 No. 22

THE TIME TO TELL THE TRUTH

The paper industry that lives and grows on publicity, is the least publicized of any major economic force in the country. Whether or not that is the desire of the leaders of paper and pulp making is not clear—the result of this situation, however, is crystal clear. And that result is the position of paper making as neither defense nor a civilian effort, but rather something that can be swept one way or another as the winds of Congress, strategy boards and all other bureaus blow it.

Why should this be when here is one industry that has successfully met the demands of war plus those of peace without the agonizing birth pains of new plants, without recourse to fabulous financial arrangements. All this, in the face of having more than 40% of its raw material supply cut off by the elimination of pulp imports from Sweden and Finland.

Silently this industry set back and listened to the forecasts of paper shortages. The cry of men (ignorant of the ability of this industry) that a 6,000,000 ton shortage of paper was inevitable was permitted to frighten paper buyers and users.

Where is the benefit to this industry in the picture of thousands of storekeepers eliminating paper containers, delivery stores removing articles from cartons on delivery and taking the used cartons back to be reused and reused. Under the guise of a paper shortage practices have crept in that benefit no one. Today we find some of our outstanding mills advertising that the paper shortage was a myth. Isn't that locking the stable door after the well known horse has become a fractious colt?

The campaign for gathering waste paper (when no shortage existed) resulted in jammed warehouses and a dead market. The industry must prevent such hysterical fiascos before they ever begin.

With no attempt at smugness we quote from our editorial of October 2, 1941:

"A statement that a paper shortage exists or will occur next week, next month or next year means one of two things; that the speaker does not know what he is talking about or neglects to mention in what grade of paper or paperboard the scarcity is or may exist."

We further said in closing:

"What the future may bring forth is uncertain, but the productive capacity of the industry is so large that if it is able to obtain the raw materials, a serious shortage of paper is not likely to occur, even next year, when Government buying of almost everything is supposed to reach unparalleled heights."

Why was this industry silent, except for the voice of PAPER TRADE JOURNAL?

To answer that bluntly, it is because this industry needs a central system of public relations that will place it in its proper position as a major industry that knows where it is going, how it is going there, and will publicize this essential and capable industry as efficiently managed and prepared to do adequately whatever is asked of it.

Publicity, the life blood of this industry, should no longer be ignored, not merely as a means of increasing the sale of paper, but this industry's means of acquainting customers and potential customers with the true story—that their needs can be met, both war and civilian requirements.

Writing paper, newsprint, text, cover, book, wrapping paper and board, can all trace their growth to advertising and publicity. The industry as an industry has grown despite its efforts to "hide its light under a bushel."

There is so much "copy" in the steadiness and foresight of this industry that it has been accepted as commonplace. When will the paper industry wake up to its own importance?

FORESTS OF THE SOUTH

An article of unusual interest to the pulp and paper industry entitled, "Amazing Potentialities of South's Forests," by Mr. Warren T. White, general industrial agent of the Seaboard Air Line Railway, appears on another page of this issue. In this article is given a brief history of the progress of the pulp and paper industry in the South and the contribution which the industry is making towards the establishment of a sound forestry policy in that area.

A continuous supply of pulpwood is a matter of vital interest to the paper industry. In some parts of the United States and Canada, existing timber supplies have been depleted to the point where pulp mills have been faced with a serious problem as to their supply of pulpwood. In recent years the eyes of the industry have been centered on the South by reason of the many new mills built in that section. Anything which contributes towards the stability of future timber supply is of more than passing interest to the industry as a whole.

The article by Mr. White is very reassuring, not only as to timber needed for pulp and paper and other uses during the present emergency, but for future large demands which the industry is expected to make upon that area.

MANPOWER SITUATION

The manpower situation is expected to become more acute in the near future in all industries not classified as most essential to the war effort. A government decree to curtail paper production would be unnecessary, for as labor is diverted from the cutting of pulpwood logs less pulp would be produced and the paper output could be easily controlled through limiting its most important material.

It is reported that President Roosevelt foresees a total of 9,700,000 men in the armed services by the end of next year. How serious the labor supply situation is regarded is reflected in a report of the Management-Labor committee reporting to the War Manpower Commission. It recommends that government and labor-management take seven steps including the following: That the government determine the overall manpower program and centralize authority for administering it; transfer Selective Service to WMC; stop voluntary enlistments, and coordinate military and civilian training programs. It recommends that labor-management accept WMC policies; eliminate labor turnover; accelerate transfers to wartime jobs and replacement training, and use skills and capacities of workers to the maximum.

While the Management-Labor Committee did not report on hours of work, the Truman Committee of the Senate recommended a general 48-hour week throughout industry. In England working weeks of from 55 to 60 hours are now maintained.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1942		Corresponding Weeks—1941	
October 10	88.1	October 11	102.1
October 17	89.6	October 18	105.5
October 24	89.9	October 25	106.4
October 31	92.9	November 1	108.6
November 7	89.9	November 8	105.0
November 14....(Prelim.)	*89.6*	November 15	107.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	104.5	103.9	102.9	100.4	95.3	87.3	75.8

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	105.2	106.2	100.4	97.4
1942	80.8	82.9	*90.4*	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date.	69.5	79.5	83.7	71.1	82.0	86.1	96.6	*91.9*
Year Average.	69.9	80.4	79.8	71.5	83.4	85.6	97.4	...

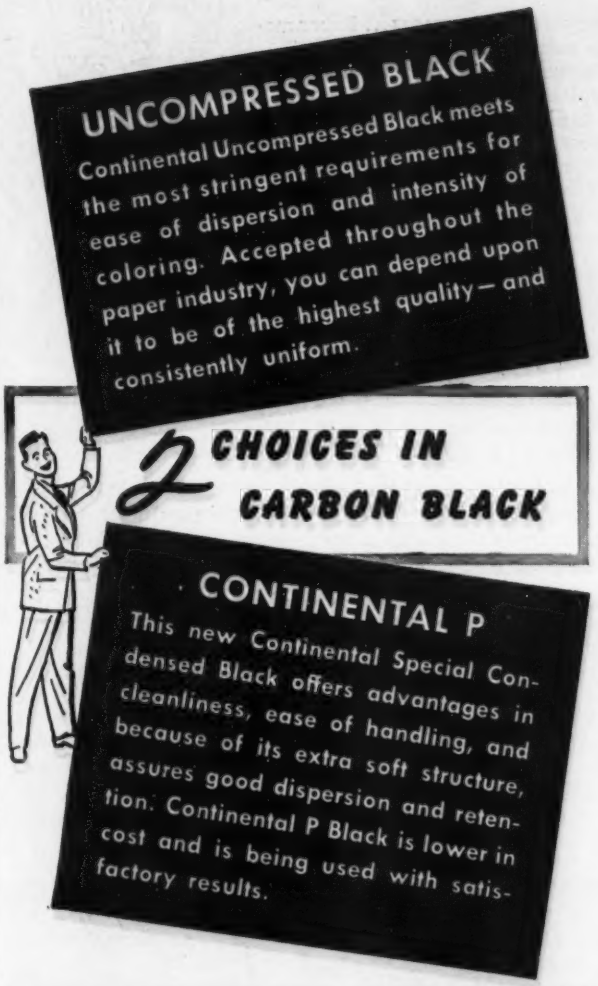
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	*81*	..	..	..

Week ending Oct. 10, 1942—80
Week ending Oct. 17, 1942—79
Week ending Oct. 24, 1942—81
Week ending Oct. 31, 1942—84
Week ending Nov. 7, 1942—84
Week ending Nov. 14, 1942—83

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.


UNCOMPRESSED BLACK
Continental Uncompressed Black meets the most stringent requirements for ease of dispersion and intensity of coloring. Accepted throughout the paper industry, you can depend upon it to be of the highest quality—and consistently uniform.
2 CHOICES IN CARBON BLACK
CONTINENTAL P
This new Continental Special Condensed Black offers advantages in cleanliness, ease of handling, and because of its extra soft structure, assures good dispersion and retention. Continental P Black is lower in cost and is being used with satisfactory results.

WHICH OF THESE TWO CARBON BLACKS BEST SUITS YOUR SPECIAL NEEDS?

Are you using the right carbon black? Continental offers you the choice of two types, each of which offers advantages when used under certain conditions and for certain purposes. One is Continental Uncompressed and the other is Continental P. It will pay you to make a careful check-up and determine which will give you the most satisfactory results. We will gladly help you in making this check-up and give you expert assistance in using the type you select in order to obtain greatest efficiency and economy.

Both Continental Uncompressed and Continental P are produced under an exceptionally rigid system of control. Continental is a modern company, with a production and technical staff of long experience and special training in the manufacture and use of carbon black. Ask our staff to help you select the right Continental Black best suited to your needs.

Continental CARBON BLACK

CONTINENTAL CARBON COMPANY, 295 Madison Ave., New York, N. Y.
Akron Sales Office: Peoples Bank Bldg., Akron, Ohio

SALES REPRESENTATIVES: Ernest Jacoby & Co., Boston, Mass. • Marshall Hill, Los Angeles and San Francisco, Cal.

Wax Emulsions

TO REPLACE DRY WAX

on paper and paper boards

FIVE IMPORTANT ADVANTAGES... Paper machine treatments with wax emulsions may sometimes be used to advantage to replace dry waxing. It is granted that a film applied by this means is not comparable to a heavy coating of dry wax, but there are cases where heavy coats are not required or desired. The advantages of the use of emulsions versus dry waxing are as follows:

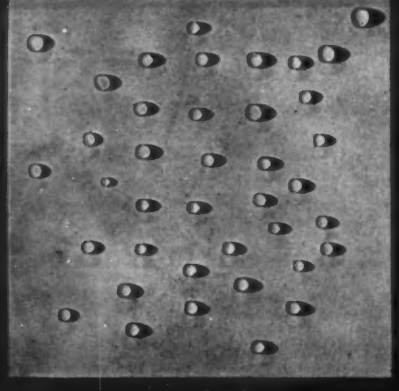
1. Wax may be applied at the paper machine, thus eliminating an extra operation.
2. The paper is not discolored as in the case of dry waxing.
3. Penetration of the wax into the sheet is better controlled.
4. Water soluble modifying ingredients may be used with the wax.
5. Application of wax emulsions does less injury to resistance to hot aqueous liquids than dry waxing.

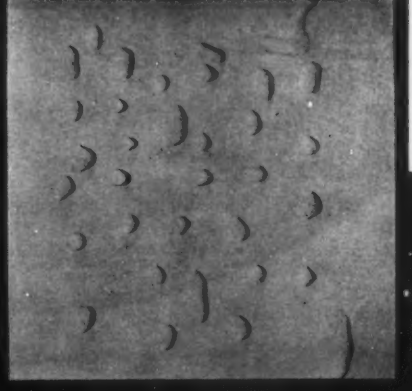
Effects secured by paper machine applications of wax emulsions are capable of wide modification. When wax is suspended in water, its absorption by paper is affected mainly by the water resistance of the paper which is more easily adjusted than resistance to absorption of molten wax. The degree of slipperiness of the sheet may also be controlled to a certain extent. Special emulsions have been developed by Cyanamid to do different [illegible] and others are in the development stage.

SIX IMPORTANT RESULTS... A number of effects may be secured by treating paper and paper board with wax emulsions. The more important ones are listed below:

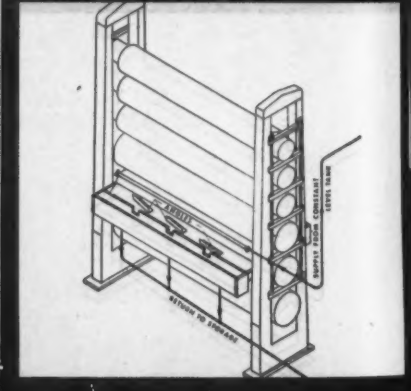
1. Smooth finish.
2. Increased resistance to scuffing and abrasion.
3. Lowered coefficient of friction.
4. A water repellent effect.
5. Increased resistance to the penetration of water.
6. Resistance to absorption of organic liquids, such as printing inks and varnishes.

Cyanamid Technical Service Representatives are experienced in the application of these products to secure the different effects and will be glad to discuss general and specific problems in this connection, with you.





Unretouched photographs showing, *(upper left)* "duck's-back" effect of paper treated with Alwax size compared with paper, *(upper right)* that has not been treated with this material.



Design of water box that is very satisfactory for the application of chemicals to paper boards at the calenders. Enlarged detailed drawing on request.

WAX SIZES • COATING MATERIALS
ROSIN SIZES • SYNTHETIC RESINS
CASEIN • ALUM • CORN STARCH
TAPIOCA FLOUR • SULPHONATED OILS
FILLERS • DEFOAMERS
WETTING AGENTS and
OTHER PAPER CHEMICALS
Reg. U. S. Pat. Off.

American Cyanamid & Chemical Corporation

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DISTRICT OFFICES: [illegible]; Philadelphia, Pa.; Russell & Bayard Streets, Savannah, Georgia; [illegible] Boulevard, Charlotte, N. C.; 850 Leader Building, Cleveland, Ohio; 20 North Wacker Drive, Chicago, Ill.; Miller Road, Kalamazoo, Michigan; 931 Penobscot Building, Detroit, Michigan; 1700 Shell Building, St. Louis, Missouri; Azusa, California

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
Edited by R. G. Macdonald, Secretary

The Variable Angle Surface Illuminator*

By John H. Graff†

The variable angle surface illuminator is a microscope illuminator for photographic and visual inspection of the surface texture of materials, based upon the principles that, if the optical axis of the microscope, the optical axis of the illuminant, and the axis of rotation of the illuminant (perpendicular to the axis of illumination) intersect at the same point in the plane of observation, regardless of the angle of incidence of the illuminant, the surface of the material to be examined lies in the optical plane with its machine direction parallel to the axis of rotation of the illuminant. Visual comparison of such surface textures can be made by photographing comparable materials at a given angle of incidence.

Two instruments have been designed for this purpose: One is an illuminator to be attached to an ordinary square-stage microscope together with a specially constructed sample holder which, within certain limits, will keep the surface to be examined in the optical plane at the intersection of the different axes, regardless of the thickness of the sample; the other is a specially constructed microscope with an attached illuminator, so designed that the plane of the support of the microscope proper is also the optical plane of observation. This microscope with its illuminator can be used for comparing surface textures of plane surfaces, square blocks, and cylinders without having to cut any sample of the materials to be compared.

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Mass., Sept. 29-Oct. 1, 1942.

† Member TAPPI; Research Associate, The Institute of Paper Chemistry, Appleton, Wis.

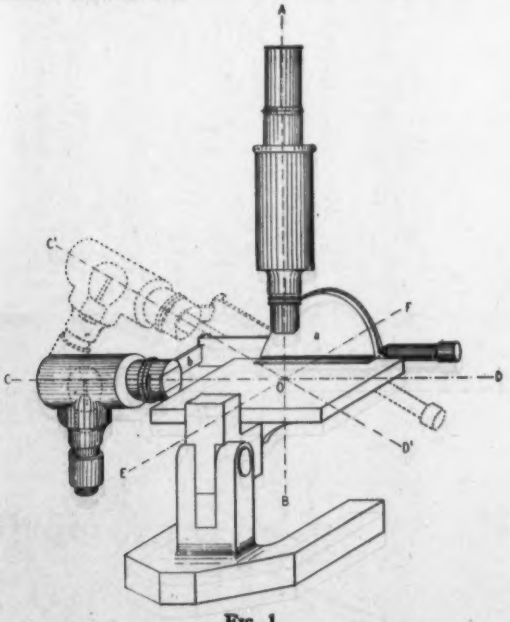

FIG. 1
Relationship between Optical Axis of Microscope, Axis of Illumination, and Axis of Rotation of Illuminator

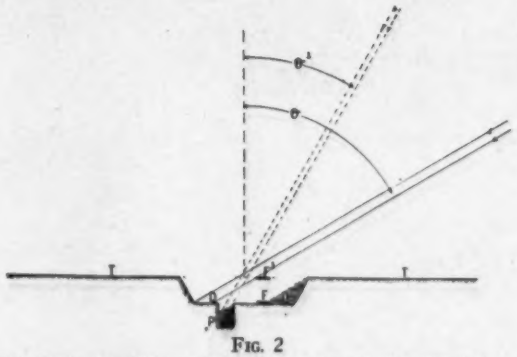

FIG. 2
High Light and Shadows in Relation to the Angle of Incidence of the Light Beam

The variable angle surface illuminator is designed to be used with any square-stage microscope for the study of surface textures of paper and similar materials. The design of the illuminator and its method of attachment to the microscope are such that the axes A-B, C-D, and E-F in Fig. 1 are perpendicular to each other and intersect at the same point in the plane of observation. The axis C'-D' intersects the axes A-B and E-F at the same point, regardless of the angle of incidence of the illuminator.

Principle of the Illuminator

When a beam of light strikes a surface with a texture such as that shown in Fig. 2 at an angle of θ, all the shaded portion in the figure will be more or less dark, whereas the top surface and the left-hand side of the indentation will be brightly illuminated. If the angle of incidence of this light beam is decreased to θ', all the depression D-D will be illuminated as the top surface T, and the detail at F will seem to be level with T at F'; however, the right-hand portion of the secondary depression P (in paper pinholes, etc.) will still be dark, and the angle of incidence of the beam must be further decreased to eliminate all the shadows in this secondary depression.

When a sample of paper or any other material is placed on the microscope with the illuminator (as in Fig. 1) set in such a position that the machine direc-

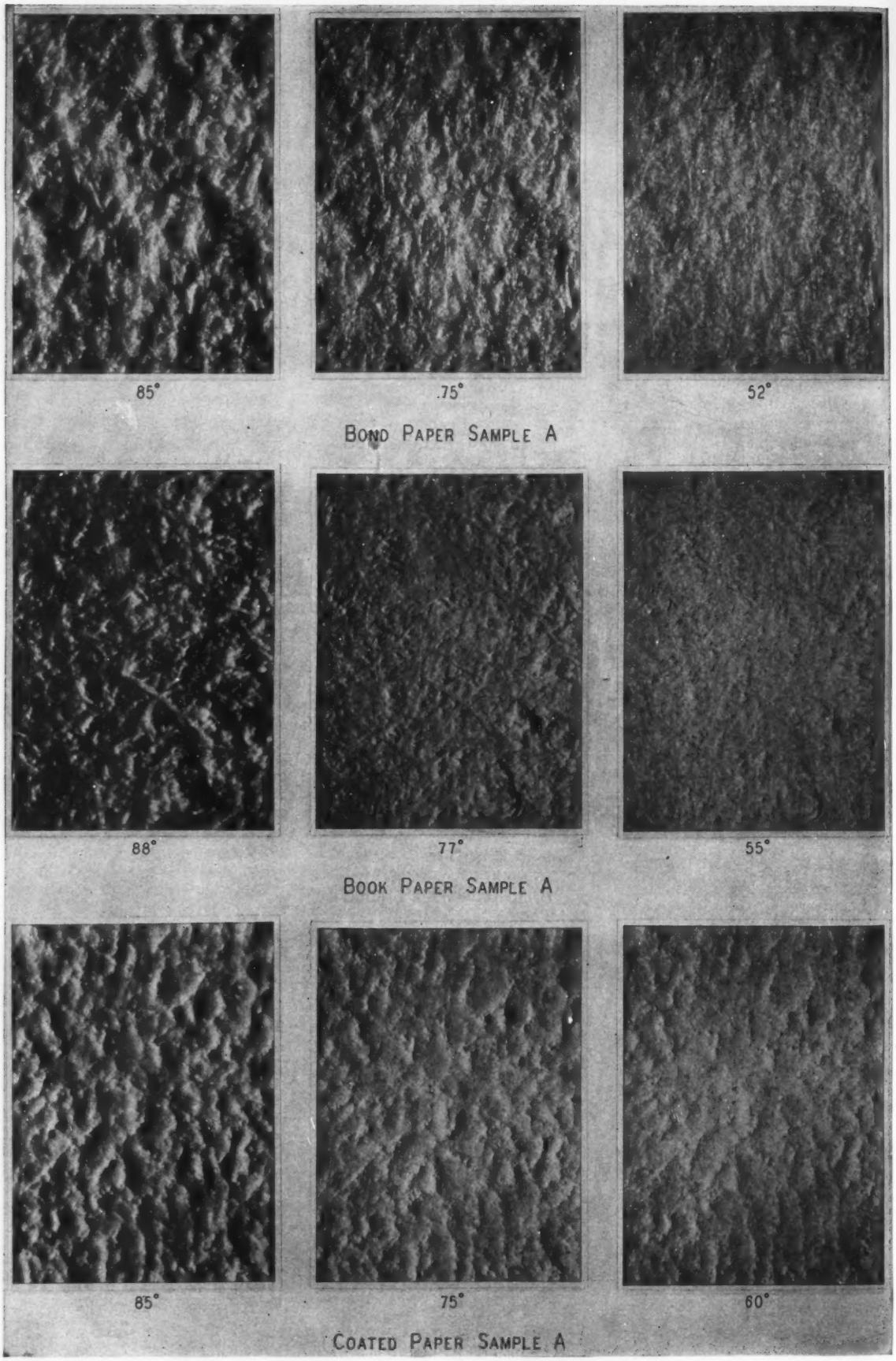

FIG. 3—Photomicrographs Showing Surface Texture of Wire Side of Papers at Different Angles of Incidence

tion of the sample is parallel to the axis E-F and its top surface lies in the plane of the intersection of the axes, then the surface texture, when illuminated with a grazing beam of light or a light beam at a high angle of incidence, will present a pattern of lights and shadows. These shadows will gradually disappear as the angle of incidence of the light beam is decreased, as shown in the photomicrographs of bond, book, and coated papers (Fig. 3).

The illuminator is equipped with one heat-absorbing filter and two contrast filters (blue-green and red). The heat-absorbing filter is necessary when determining the surface texture of very thin paper or similar materials, because the heat from the light beam otherwise would tend to buckle the sample. The contrast filters are to be used when the sample is examined with a combination of transmitted and reflected light.

Surface Texture

The angle of incidence should be so chosen that the contrast between light and shadows is such that every depressed and elevated feature of the surface can be clearly distinguished and the details in the shadows can be observed. It should be used, not only to study felting characteristics of the fibers in a paper and the observation of the number and relative widths of surface depressions, but also to make photomicrographic visual comparisons of the surface textures of different samples of a material. When this is done, the smallest angle of incidence found in which the depressions and elevated shadows can be clearly distinguished, without losing detail in the deepest shadows, should be selected as the angle of incidence to be used for taking photomicrographs for visual comparison of the surface texture of a comparable set of samples.

As the light intensity is indirectly proportional to the angle of incidence of the light, the relative exposure of the photographic emulsion used will, of course, increase with the increase of the incident of light.

Sample Holder

To fulfill the demand of the principles of the illuminator the plane of observation must lie in the plane

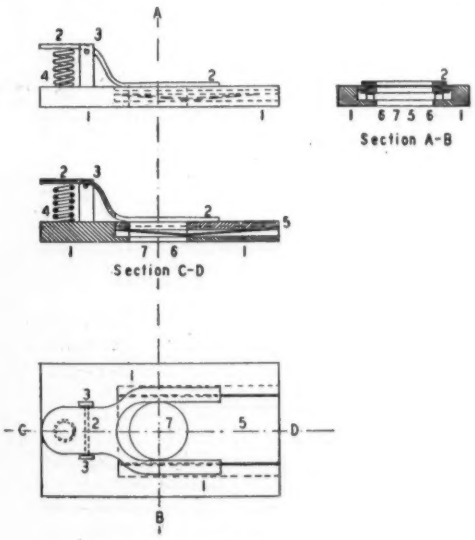

FIG. 4
Sample Holder for Variable Angle Surface Illuminator

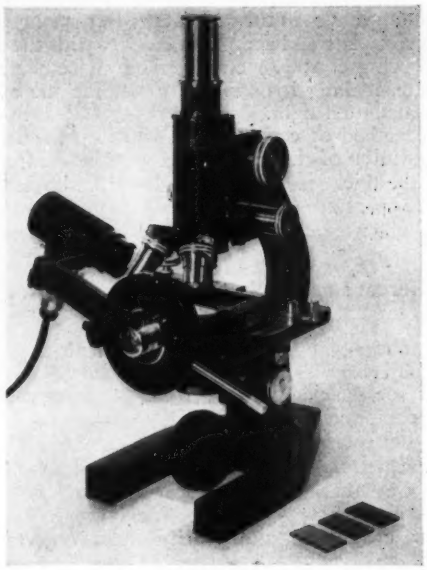

FIG. 5
Variable Angle Surface Illuminator and Sample Holder Attached to Microscope

of intersection of the axes A-B, C-D, and E-F, as shown in Fig. 1. A special sample holder has been constructed, therefore, so that the plane of observation of the sample, within certain limits, will always be in the plane of the axis of the illuminator when the knife-edge beam of light is parallel to the plane of the sample, provided that the axis of this beam of light is first adjusted to the same height as the top plane of the sample, and, further, that this beam intersects the optical axis A-B of the microscope in the plane under all possible angles of incidence.

The sample holder is shown in Fig. 4, in which the various parts are designated as follows: (1) bedplate holder; (2) forked spring clip for clamping the sample into position; (3) pivot arm holding the spring clip; (4) spiral spring pressing the fork of the spring clip in contact with the bedplate; (5) rest plate for sample (the sides of this plate are grooved to fit into

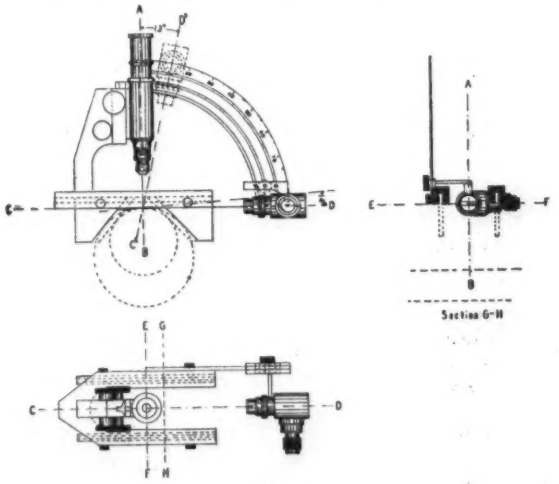

FIG. 6
Schematic Drawing of Microscope for Variable Angle Surface Illumination

opposition grooves in the bedplate); (6) spring pressing the rest plate and sample in contact with the forks of the spring clip; (7) circular hole in bedplate and rest plate, making it possible to examine the sample with transmitted light.

This method of construction will keep the surface of observation of the sample in a given plane, regardless of the thickness of the sample in the holder. The general appearance of the illuminator and the sample holder, when attached to the microscope, is shown in Fig. 5.

Microscope for Variable Angle Surface Illumination

This microscope is so constructed that the top plane of the object under examination is also the plane of support for the microscope; it can be supported and used for examination of cylinders and square blocks.

The microscope is equipped with a variable angle surface illuminator attached to the microscope in such a way that the objects can be examined with reflected light at true angles of incidence from 90 to 13° for cylindrical and block-shaped objects and with angles of incidence of the illuminant from 86 to 13° on ordinary flat planes.

The instrument is based upon the principles shown in Fig. 1—that is, the axis of the illuminant always intersects the optical axis of the microscope at the plane of observation, regardless of the focal length of the objective used and the angle of incidence, θ.

This microscope and illuminator can be used to study the surface characteristics of cylindrical and flat materials with illumination at variable angles of incidence to the optical axis of the microscope, without having to cut the sample or otherwise destroy the material to be examined, such as textiles, painted and polished surfaces, printing and engraving rolls, calender rolls, plastics, ceramics, etc. Figure 6 shows a schematic illustration of this microscope, with attached illuminator.

The United States patents (from which additional information can be obtained) covering the above equipment are as follows: 2,120,404 (June 14, 1938), sample holder; 2,144,653 (Jan. 24, 1939), variable angle surface illuminator; 2,208,882 (July 23, 1940), the illuminator with microscope attachment.

Technical Departments Meet War Problems*

By F. H. Frost[1]

Organized Research

Organized research on a large scale was initiated in the pulp and paper industry during the depression which followed the "something for nothing era" of 1929. Previous to 1929, the seeds of an expanding research program were sown by such outstanding personalities as my friend and colleague, the mild mannered Ed. Sutermeister, George Spence, Otto Kress, and other notables.

Organized research involving large laboratories did not start until after 1929. Growing pains were frequent. Trial and error methods in which all the bottles on the shelf had their opportunity, were at first all too common. It took time for the owners and managers of paper businesses to appreciate that dividends would not flow overnight from miraculous test tubes; it took time to appreciate that the strict, slow scientific approach was the only method that could lift the paper industry from an art to a science. One of these days we will realize that this has been accomplished—that papermaking can justifiably be called a *Science*.

Objectives

The paper laboratories of today face the greatest crisis, as well as the greatest opportunity of their short existence. They have the opportunity to prove themselves as a vital and necessary force in total war. Our problem appears clear cut, clearly defined. We must accomplish three main objectives.

First we must, working under heavy pressure, find substitutes for papermaking raw materials needed in the direct war effort. These substitutes must be in a nonessential classification and they must not seriously impair the quality of our standard products. This is our first job.

In many instances, the finding of a substitute is an easy matter. It is simply one of determining which of other available materials may be used to replace the critical material involved. An illustration would be the substitution of solvents necessary for the preparation of casein. If ammonia was being used and was scarce, a possible substitute might be caustic. The successful use of caustic, in place of ammonia, would not involve a long hunt but would involve detailed studies of the effect of caustic on the viscosity characteristics of the coating formulas under consideration.

Adhesives

Again we may find ourselves faced with the necessity of finding a substitute for a major papermaking material such as casein. Many substitutes are available. The cheapest and most plentiful being starch. However, starch has for many years been considered an inferior material, compared to casein, if used as an adhesive in coated paper. Therefore, the job of substitution includes the work of perfecting starch as an adhesive, so that when it is substituted for casein, it is an equal or superior material. This type of work is a major project and such a problem could not be solved without the close cooperation of starch manufacturers.

In certain instances we may be faced with the necessity of finding substitutes for papermaking materials so basic that the problem seems hopeless. Such a material might be wood fibers. Our chances of finding a substitute for wood fibers are not too good but we can meet such a problem by making our pulp go further. We can accomplish this by obtaining higher yields, by using a higher percentage of filler, by running lighter weights, and reducing our waste.

All in all, I fail to see how a laboratory can avoid the responsibility for the development of substitutes for papermaking materials. It seems to me that the

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laboratory program should be planned with enough flexibility so that such problems can be handled if they arise suddenly or unexpectedly.

PAPER AND PAPER PRODUCTS

Our second main job is to develop paper and paper products which can effectively replace products now made of other essential materials. This again is a job of substitution but it means substitution in fields with which we are not familiar. This in turn means that our laboratory organization must be so set up that we can quickly acquire a background and working knowledge of the fundamental needs of other industries. If we effectively handle such developments we should be able to make a *paper* can which will replace a *tin* can. We should be able to make *paper* sheeting which will replace *rubber* sheeting, and there is always the possibility that someone in our group, smarter or more versatile than the rest of us, will produce a spectacular product from paper, such as a paper automobile tire.

Such development work is most certainly difficult but our background in paper research has reached a point where if we fail to meet this challenge, we fail solely because of poor laboratory organization or lack of faith in our own ability.

Our third job is also vital and is a real challenge to our imagination and ingenuity. This job is the responsibility of constructing entirely from our imagination, new products made from papermaking materials that will directly help us win this war. An example of such a product is the phosphorous calling cards invented and used with success by the English. Another example would be a poison gas container made of paper which, when used as a bomb will allow a city to be effectively immobilized by liquid poison gas.

There is no finite limit to imagination and the possibilities of accomplishment are great.

In the development of a new weapon, a new defense, or a new essential civilian use made from papermaking materials, several stages are nearly always encountered. As a rule, we start with the basic idea which is the fruit of our mind. The second phase is the translation of this idea into a practical product and this is dependent upon our research skill and ingenuity. The third phase, and a difficult phase, is the demonstration of the soundness of our product and the selling of our product. When we attempt to sell a new product, that we believe will be useful in the war effort, we must do an immense amount of work in proving that our new product has no serious inherent faults. Technologists who are capable of working with the sales department in the development of such ideas are rare indeed and it is my opinion that unless such men are available, many worthwhile projects may end in failures.

Organization of our research activities should be integrated, of course, to handle effectively these three main projects. The particular methods of organization will vary with the individual laboratory and mill but we can clearly see that no laboratory will have a great success unless that laboratory has built up a background of papermaking knowledge. In addition the laboratory personnel must include individuals with a high degree of imagination, its staff must be thoroughly and scientifically trained, and it must have competent men able to work directly with the sales department in carrying forward an initial contact with other laboratories or with our Army or Navy.

The problem of personnel and of keeping our personnel is going to be difficult. We can overcome this problem only if we work constantly at the job of finding and training individuals who may for one reason an other be available.

That, as I see it, is the technical job, we, as laboratory personnel, face. It is a big job but it is high time the honeymoon period in paper research is ended and that we demonstrate that if it can be done with paper, we can effectively organize to see the job is done and done quickly.

New Book on Plastics

Plastics for Industrial Use by John Sasso, Associate Editor of Product Engineering, a 230 page illustrated book published by McGraw-Hill is now available. This book is timely in view of the efforts being made by engineers to develop new construction materials. Among the subjects covered are basic compounding materials; principles of design; faults; causes and remedies in molded parts; phenol; urea; vinyl; acrylic plastics; polystyrene; vinylidene chloride; cellulose acetate; ethyl cellulose; plywood and adhesive and laminated plastics. No mention appears to be made of lignin plastics although this is an interesting development. However, there is much in the text that will be of value to workers in the field of any type of plastic materials.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York, N. Y. for $2.50 per copy.

Waste Treatment

McGraw-Hill has recently published an interesting book by E. F. Eldridge, Research Associate, Michigan State College, Engineering Experiment Station, on Industrial Waste Treatment Practice (400 pages, illustrated). This is a practical book covering stream pollution; characteristics of industrial wastes; standard treatment methods; structures; and equipment; industrial wastes from beet-sugar mills; milk products factories; canneries; tanneries; pulp and paper mills (including old paper stock, rag stock, straw, sulphite and other pulp mills); textile mills; slaughter houses; laundries; gas plants; fermentation industries; domestic sewage; methods of analysis for industrial wastes. The chapter on papermill wastes is up to date and surveys the field in an interesting way.

Copies of this book may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y. for $5.00 per copy.

International Buys Eddy Paper Mill

The International Paper Company has purchased the Three Rivers, Mich. plant of The Eddy Paper Corporation. G. C. Radke, manager of the plant, said that the deal was consummated November 11. The sale included two paper machines, 110 and 112-inch trim, together with land and buildings housing the equipment.

The Eddy mill discontinued operations October 7, and it is understood that the mill will remain idle for the present, and the machines held for the needs of the industry.

Fuel Problems in War Time*

By Edwin F. Burns[1]

Abstract

A resume of the work of the heat and power committee in regard to its study of fuels is given and it is pointed out that the committee originally intended to treat the subject on a long term viewpoint basis.

The work of the committee is to be continued on this basis, but due to the present emergency, it is felt that consideration be given to points which require immediate attention.

It is pointed out that the more important problems confronting the industry today are those of transportation, storage of coal and making the most of what we have or can obtain in the way of fuel.

Transportation bottlenecks are pointed out, with possible means of overcoming transportation difficulties.

Coal storage is discussed at length not only from the standpoint of the size of the inventory but also from the standpoint of proper storage methods and protection of piles against spontaneous combustion. Accepted theories are given concerning causes of stock pile fires and present-day methods are cited for the elimination of spontaneous combustion in stock piles.

Suggestions are made and methods are outlined to assist plants in getting the most out of fuels with which they have to deal. Various economies are suggested in order to reduce steam plant load and cooperation, where possible, with adjacent plants is recommended.

In February, during the 1942 Annual Meeting of the TAPPI in New York, the writer reported that the Heat and Power Committee of the TAPPI Engineering Division had decided to make a study of fuels to aid in their conservation in the paper industry, and by so doing, benefit not only the industry but the war effort as well.

When this subject was first discussed in committee in September, 1941, we were not actively engaged in the war. Our idea at that time was to study paper mill fuels with a long term viewpoint, giving consideration to:

1. The geographical location of the plant in relation to fuel sources
2. The most economical fuel to use in each location
3. Changes in plant equipment necessary to obtain the ultimate in low cost steam production.

In other words, we had in mind the formulation of data indicating ways and means toward lower steam plant generating costs—cheaper steam.

The response to questionnaires sent to the industry is extremely gratifying. A report will be distributed shortly to those who participated in the survey. We are at the present time regrouping the reporting mills geographically and according to equipment, in order that the data may be studied more easily.

The study will be carried through to a definite conclusion as quickly as practicable, setting up information which will be definite and as permanent as possible.

Today, however, we must temporarily alter somewhat our approach to the fuel problem and deal with it from the emergency angle rather than the permanent.

In February we asked ourselves if our storage supplies were sufficient to carry us through emergencies. Washington has been asking, pleading, almost demanding for months that stock piles be increased. Many of us have heeded the warning.

We again asked ourselves, where dependent on oil, if thought had been given to possible fuel-oil rationing. Very few reporting mills apparently are dependent upon oil for fuel, and luckily, because it is now indicated that fuel-oil rationing is almost a certainty.

A year ago one of our first thoughts and rightfully, was to reduce steam-plant generating costs. Today in a great many cases, it may be "where will I obtain sufficient fuel to continue to operate."

It appears, then, that the present approach to our problem during this emergency is:

1. Transportation
2. Storage
3. Making the most of what we have or can obtain.

1—Transportation

New England

Since Pearl Harbor, there has been a very decided change in the fuel-transportation situation. Due to the German submarine offensive on the Atlantic seaboard, a large number of tankers have been sunk, which has caused a decided shortage of fuel oil in New England. This has necessitated the conversion to the use of coal in many plants which formerly used oil.

Although there have not been a great many colliers sunk, curtailment of collier movement was severe due to the fact that vessels could not travel after dark and had to use much longer routes in transit to avoid submarines.

New England, which had always depended very largely on water-borne shipments from West Virginia, therefore, was in a bad way for its fuel supply and was forced to look to other coal-producing fields to obtain sufficient tonnage to fulfill its requirements.

New England always has benefited through water transportation of high-grade coals at reasonable costs. The Pocohontas and New River coals of West Virginia are among the finest produced any place in the world. These coals are moved from the mines to loading piers at Hampton Roads where they are loaded into colliers for movement to the various docks along the New England coast for distribution to plants in the New England area. A large tonnage of the coal is trucked from New England docks to the consuming plants, but the great percentage is moved from the docks to consuming plants by railroad.

Although the Pennsylvania coal-producing fields are closer to the New England consuming market than those in West Virginia, they ordinarily cannot compete in the New England market with the southern coals due to inferior quality and a higher delivered cost. Consequently, only a small percentage of Pennsylvania coal normally is used in New England. Since

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TAPPI Authorized Project 174, Engineering Division, Production and Transmission of Power Subcommittee.

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Pearl Harbor, however, because of the inability on the part of the various transportation facilities to move a sufficient tonnage of southern coal to the New England market, it has been necessary for the consumers in that area to go to Pennsylvania to augment their supply. This has caused considerable confusion and much higher steam costs.

Plants which normally used a high-grade New River coal have had to be satisfied in some cases with stripping coal from Pennsylvania running considerably higher in ash and moisture and correspondingly lower in B.t.u.'s The physical characteristics of a stripping coal are vastly different from the New River coal and present entirely different operating problems.

The Government finally recognized the difficulty New England was experiencing and put through emergency measures which enable the high-grade southern coals to be moved all-rail from West Virginia to New York Harbor at reduced rates, and then transported via barge to New England destinations. They further established a subsidy which reimbursed the New England consumer for freight charges in excess of what they normally would pay if the coal were routed through its normal channels.

These measures enabled the New England consumer to procure the high-grade southern coals that they are accustomed to burning at reasonable prices, and to eliminate to a large extent the necessity of using the poorer coals produced in Pennsylvania.

It is hard to see, however, how the mere establishment of a Government subsidy to reimburse the New England consumer will provide more coal cars to move this additional tonnage all-rail, or if the cars can be made available, how it will eliminate or help rail traffic congestion.

It is my firm belief that eventually long rail hauls will be frowned upon except where these long hauls are absolutely necessary to aid utilities and war projects. This automatically will again necessitate the use of poorer grade northern coals in the northeast.

The movement of West Virginia coal by rail to New York harbor for transportation via barge to New England noted above, must be made through transfer yards such as the Potomac Gateway. At the present time the railroads are doing a remarkable job in expediting the movement of coal through these gateways. It behooves the New England consumer, however, to take advantage of this situation immediately while transportation facilities are able to operate at present efficiency.

The reason for this is that these gateways may become bottlenecks during the winter which will slow down the movement of coal perceptibly, cause car shortages, and reduce tonnage which can be moved into New England in this manner. Coal shortages will naturally result and it therefore behooves each and everyone of us who have plants in New England to build up adequate stock piles, not only to protect ourselves against possible shutdown, but also as a cooperative measure to help alleviate traffic jams which are bound to occur if we try to conduct our business as usual.

Middle Atlantic and Middle Western States

Consumers located in New York, New Jersey, Pennsylvania, Ohio, and the middle western states which receive their coal all-rail from coal-producing fields adjacent to their plants are in a somewhat better position than New England.

It is true that some of us operating plants in some of these areas have had cause to be more or less disturbed through our inability to procure coal of suitable quality to maintain the utmost in operating efficiency.

This section of the country under discussion probably does not face the same danger from coal shortages as does New England. However, the whole transportation picture is so dovetailed, one section with another, that anyone of a number of factors may cause us to experience shortages in these states. Among others, they are: weather conditions, traffic tieups due to the movement of essential raw materials and finished products to and from the war industries, and car shortages that might curtail receipts of coal below actual consumption.

The Government has restricted the movement of coal this year by the Great Lakes in order to expedite the movement of iron ore. I am advised that plants in certain localities which ordinarily receive 100% of their coal via rail to Great Lake ports and thence by water to destination, can now only receive 50% in this manner. The remaining 50% must be moved entirely by rail, which means longer rail hauls further tending to complicate the transportation situation and adding to possible car shortage.

I would therefore strongly suggest that if mills operating in these states have not already done so, they increase their stock piles materially to cope with this situation.

Ontario and Quebec

It appears now that plants located in eastern Ontario and Quebec which normally obtain their coal via the Great Lakes may get their full quota this year. Coal transported to these plants is normally transported in Canadian vessels which do not come under United States Government restrictions. It would seem that their main problem is to keep after the coal producers to make sure that their maximum tonnage is shipped from the mines to arrive at lake ports before the close of navigation on the Great Lakes.

The coal producing fields of West Virginia, Virginia, Kentucky, Ohio, and Pennsylvania which normally serve this market, we believe, are doing an excellent job and will undoubtedly take care of all of their Canadian commitments, provided, of course, that Canadian boats are able to handle the entire tonnage and the transportation of the coal to destination.

We would suggest that all Canadian mills obtaining coal via the lakes keep after their producers and boating companies to give them as much of their requirements as is possible via the usual channels and as is consistent with Canadian regulations. The reason for this is obvious. If the requirements of these plants are not taken care of through the usual channels, then it may be necessary for some mills to supplement during the winter by all-rail shipments which will only add to the transportation difficulties and car shortages here.

New Brunswick-Nova Scotia

The New Brunswick and Nova Scotia mines, we understand, have succeeded in increasing their output this year, placing the consumers in eastern Ontario, Quebec, and New Brunswick which normally use Nova Scotia-New Brunswick coal in a far easier position than last year. It should not be necessary for those consumers to import coal from the states to any great extent.

They are fortunate in this respect, as about the only

way they could obtain coal from the states would be via all-rail inasmuch as there is a very decided shortage of vessels of what is known as canal size, capable of carrying coal from Lake Erie or Ontario ports through the various St. Lawrence River canals.

GENERAL

Although the foregoing has dealt with transportation conditions and difficulties in specific locations in the eastern and central states and in eastern Canada, these same conditions prevail to a greater or lesser extent throughout the entire United States and Canada. Only in isolated and limited cases will conditions prevail making it possible to overlook the transportation situation. It follows, therefore, that each and everyone of us must review his own situation thoroughly to determine what steps to take not only to provide fuel for continued operation, but to cooperate to the fullest measure to help to overcome transportation difficulties as a patriotic duty.

2—Storage

Thus far we have dealt only with possible transportation difficulties. In order to more thoroughly analyze the necessity of adequate stock piles, however, we should briefly consider some of the other factors involved.

It is reported that C. C. Dickenson, President of the National Coal Association, at a meeting of the United States Chamber of Commerce a short time ago, indicated that the coal industry is much concerned about the future.

We are, at the present time, producing about 11,000,000 tons of bituminous coal per week, equivalent to 572,000,000 tons per year. This is close to the 1926 production figure of 573,366,000 and incidentally 1926 happens to be the highest bituminous coal production year since 1918, the highest on record.

Recently Harold L. Ickes advised that *total* daily supplies of fuel oil to the east via tank cars, pipelines, etc. would be about 400,000 barrels per day short of the east's requirements for the balance of 1942. This represents roughly an increase in consumption of 8,000,000 tons of coal during the next three months or a curtailment in production necessitated by a shortage of fuel.

In addition to this possible increase in coal demand is the increased demand due to plants already converted or undergoing conversion from oil to coal at the present time. I have recently talked with representatives handling equipment used in some of these conversions and I can assure you all that they are numerous. There are some large oil consumers among them and there are going to be a great many more. Conversion has just nicely started.

Coupled with increased coal demand are some serious factors right at the mines. Due to restrictions placed on mine operators at the present time and to lack of sufficient materials for maintenance and extensions into new headings, production may and in some cases has suffered severely.

Due to higher wages being paid to miners than ever before, the miners have more money in their pockets, work less and produce less than before. Mine operators inform me that one of the reasons for drop off in coal quality is that they have less control over their employees than ever before. Then, too, there is a steady decrease in manpower due to the draft, competition with other industries near the mines, and gasoline rationing which makes more difficult the transportation of men to and from their homes.

Under present labor conditions and with scarcity of repair materials, what is going to happen to the many relatively high-cost coal producers? We have ceiling prices on coal but have not had ceiling prices on mine wages. The answer is that the high-cost producer is going to cease to produce.

All of the above, adds up to just one possible answer. The probability of a coal shortage in the late winter with its attendant use of sadly inferior coals, if we desire to continue to operate.

Bear in mind that the utilities and top ranking war industries will be taken care of, the others will be allowed to take what, if any, remains.

During the first eight months of 1941 the production of Bituminous Coal and Lignite in the United States amounted to 319,337,000 tons. The production during April, 1941 was very low due to the coal strike and, therefore, in order to arrive at a figure which will be comparable for the same period with 1942, it is necessary to make an adjustment for this amount of fuel lost during the coal strike. 40,000,000 tons seems to be a fair round figure and, therefore, I have added this amount to the above actual production, which gives an adjusted total of 359,337,000 tons. This amounts to an average of approximately 10,250,000 tons per week. During the same period in 1942 the average production per week is just slightly less than 10,800,000 tons, an increase of 550,000 tons per week or a percent increase of 5.36.

In 1941 the total industrial and retail consumption for the period under discussion was 316,885,000 tons, and in 1942, 359,758,000 tons, an increase in eight months of 42,903,000 tons or 13½% increase in consumption as against 5.36% increase in production.

Stocks as of September 1st this year are reported to be 77,591,000 tons, an increase of 30,543,000 tons over the same date last year. This represents something over seven weeks' supply on the average.

During the last four months of 1941, the consumption of fuels under discussion amounted to 167,037,000 tons, or 52.7% as much fuel as was consumed during the first eight months. I realize that in order to obtain the trend for the balance of 1942, it is probably inaccurate to use a figure as high as 52.7% of the total consumed to date this year to obtain a figure representing the consumption for the balance of the year. However, if this figure is applied, it would indicate that the consumption for the balance of the year would just about equal the production. Therefore, discounting this percentage figure slightly, we still find ourselves in a more or less hand to mouth position, definitely indicating that it will undoubtedly be necessary to draw to some extent on stock piles, if transportation difficulties occur.

How is this condition going to be met? A great many manufacturers have opposed the idea of adequate or large storage piles. They feel that the cost of storing and recovering, together with the interest on the investment represented in the pile, is too high a premium to pay for continued operation. Is it? Simple arithmetic indicates that if your investment is figured at 6% and it costs you a total of $0.20 to store and reclaim, the final increase per ton of product will be roughly $0.25 to $0.30. Figure against this your shutdown expense if your mill ceases to operate, and you will undoubtedly find that the insurance rate may not be too high after all.

Those of us who are agreed that storage, especially

during this emergency, is essential to continued operation have given a great deal of thought to the amount of coal to be carried in inventory. The two main factors governing the size of inventory are the location of the mill and the importance of the operation.

In seven of our northern United States mills we had in inventory as of September 1, 1941—30,000 tons of coal. This represented on the average about five weeks supply. As of September 1, 1942 we have on hand 66,000 tons and one mill, where we may experience the most difficulty through transportation, tieups, etc., the storage pile represents about fifteen weeks' supply.

Most certainly with the stock piles of the utilities and large industrial consumers carried at their present high levels, it is definitely indicated that although the average supply on hand is placed at something over seven weeks, the isolated plant must have on hand considerably less coal than the average.

Donald M. Nelson has advocated the storage of coal to the extent of your storage facilities. We believe two months' supply to be the absolute minimum and in cases where severe difficulties in securing coal may be experienced, up to four months. In some cases it may be necessary to locate part of your storage pile some distance from your boiler house, as is the case in one of our mills, where the major portion of our storage is more than one mile from the mill.

Thus far I have attempted to point out transportation bottlenecks and the importance of adequate storage. I do not intend to cover methods of storage. The location of your mill, the location of storage ground in relation to your plant, and many other factors must be taken into consideration in studying the method to be used in storing coal.

If you do not have adequate storage equipment at the present time, I doubt very much if you will be able to secure suitable priorities to enable you to purchase new equipment today. However, you may be able to pick up suitable equipment in the second-hand market, or you cooperate with a neighboring plant which has such equipment.

Such items of construction equipment normally used in handling coal have been frozen. These items are clam-shell cranes and buckets of one kind or another, bull dozers, dray lines, etc. If you have equipment of this kind on hand or can obtain it, fine. You may have some rail available for use in storage with which you can construct a trestle. These are all local individual problems and can best be considered by the individual plant.

Assuming that you have in storage adequate coal to carry you through emergencies or that you plan to increase your storage to two to four months' supply, possibly amounting to 25,000 to 50,000 tons or more, how is this storage to be protected against spontoneous combustion. Sure, your pile may be covered by insurance, but the B.T.U. value of an insurance company check is only equal to the B.T.U. in the paper upon which it is written. We lost several hundred tons from one storage pile a few years ago. The pile was covered by the insurance company. However, had we been unable at the time to replace the coal lost, mill operation would have been curtailed and our loss could not possibly have been offset by the insurance company check.

Spontaneous Combustion Control

How, then, shall we protect storage piles against loss due to heating and spontaneous combustion? A great deal, probably volumes, has been written on the protection of coal storage piles. Experience indicates that anthracite coal in storage does not fire. There-

Figure 1.—One ton of coal in a cubic cube. Surface area, 47.52 sq. ft.; volume, 22.19 cu. ft.

Figure 2.—Coal—surface area in square feet per ton of different sizes of coal.

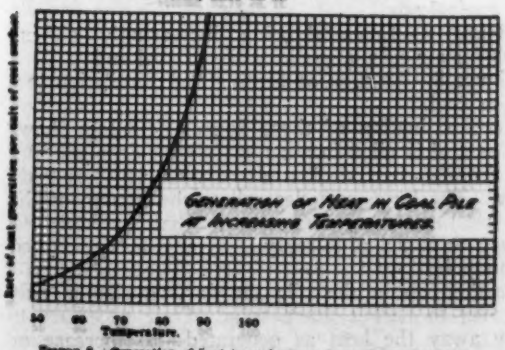


Figure 3.—Generation of heat in coal pile at increasing temperatures.

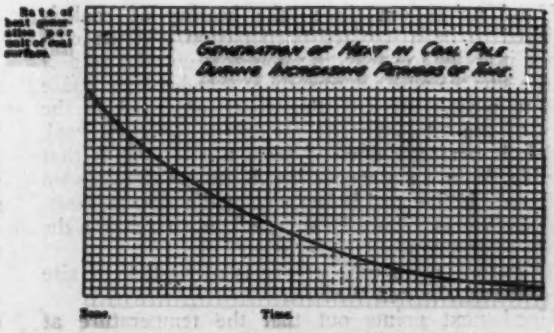


Figure 4.—Generation of heat in coal pile during increasing periods of time. Heat imparted.

Plate I

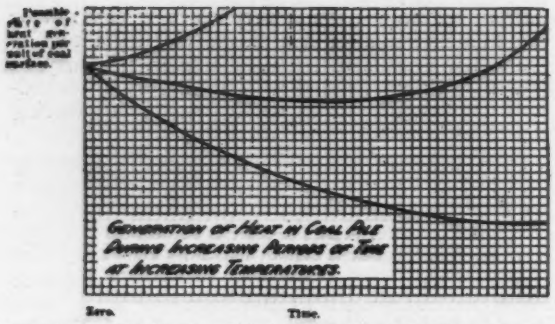


FIGURE 5.—Generation of heat in coal pile during increasing periods of time at increasing temperatures. Heat not removed.

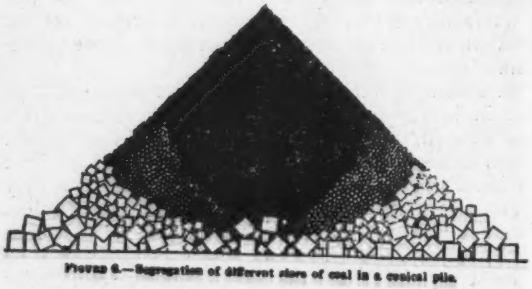


FIGURE 6.—Segregation of different sizes of coal in a conical pile.

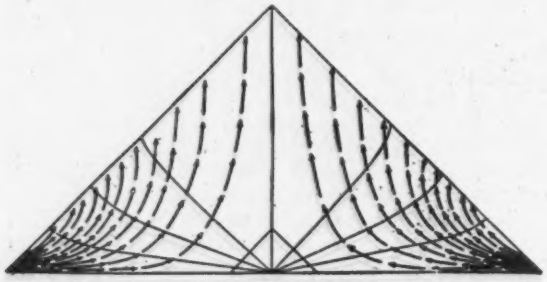


FIGURE 7.—Lines showing increasingly difficult paths for air circulation in a pile of coal.

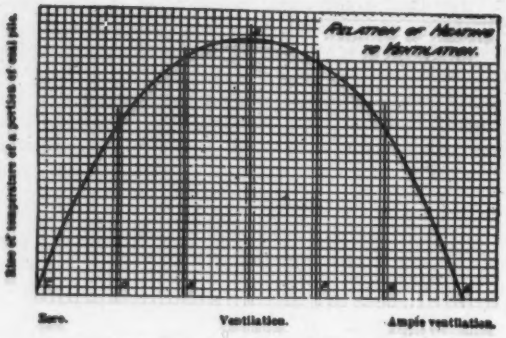


FIGURE 8.—Relation of heating to ventilation in a pile of coal.

PLATE II

fore, our discussion will deal with the storage of large quantities of bituminous coal.

The United States Bureau of Mines has undoubtedly studied this problem more completely and published more important data on this subject than any other organization in existence today. I am deeply indebted to R. R. Sayers, Director of the United States Bureau of Mines, for his kind cooperation and permission to use the following data published by his Bureau.

Following are two plates reproduced from Bureau of Mines Information Circular I. C. No. 7074 "Spontaneous Combustion of Coal" by O. P. Hood, published in May, 1939.

Plate I shows four figures:

Figure 1—A one-ton cube of solid coal—volume 22.19 cu. ft., surface area 47.38 sq. ft.
Figure 2—A graph showing surface area in square feet per ton of different sizes of coal.
Figure 3—The generation of heat in coal pile at increasing temperatures.
Figure 4—Generation of heat in coal pile during increasing periods of time.

Hood points out that: "the heating of coal is believed to be a surface phenomenon. When coal heats, it is due to something that goes on with respect to the surface and not something that happens inside of the piece. We are, therefore, interested in the area of the total exposed surface of a ton of coal, and it is perfectly obvious from this why it is that trouble from spontaneous combustion originates in fine coal. If fine coal is kept out of the pile, the heating surface is relatively so small as to remove the cause of spontaneous combustion."

Therefore, point number one is a question of size of coal and exposed surface.

Hood next points out that the temperature at the time of storage has a marked effect on the heating phenomenon of coal in storage. That the chemical reactions between coal and oxygen "doubles for every 10° rise in temperature," and that coal stored "during the hot months of summer and in heated regions is much more liable to spontaneous combustion than coal stored in colder climes and in cooler seasons of the year."

These points are ably shown in the graphs mentioned above.

The quantity of oxygen in the coal, it is pointed out, "seems to be the fairest measure of the rate of heat generation," and the high oxygen coals of the middle west and the subbituminous coals and lignites of the west show increasingly active rates of heating."

According to Hood's investigations freshly crushed coals are very susceptible to heating and coals crushed for 3 months, rarely fire.

Plate II shows, Fig. 5—Generation of heat in coal pile during increasing periods of time at increasing temperatures. Heat not removed.

Figure 6—Segregation of different sizes of coal in a conical pile.

Figure 7—Lines showing increasingly difficult paths for air circulation in a pile of coal and

Figure 8—Relation of heating and ventilation in a pile of coal.

An examination of these figures definitely shows that as coal is piled in a conical pile or dropped on a pile from a clam shell, a segregation of sizes takes place. The large particles roll to the bottom of the pile creating air passages more than sufficient to convey air sufficient to carry away any heat generated at this point.

Farther up in the pile the particle size is only sufficient to permit the passage of air necessary to carry away the heat as generated—no increase or decrease in temperature.

Above this, however, is the danger point—fine coal

interstices between coal particles too small to convey sufficient air to carry away heat generated—result spontaneous heating.

Again referring to the abovementioned circular: "If the fine coal is so densely packed as to prevent an exchange of air, there will be no heating because there will be no supply of oxygen to combine with the active surfaces. Some observers have stated that, in general, fires in large coal piles are found in the region from 5 to 8 feet below the surface on the flanks of the pile." This, too, has been my observation.

Now with absolutely no movement of air through the pile, or with sufficient air to carry away the heat generated, there will be no spontaneous heating.

The latter condition can only be brought about by the storing of screened coal which, in most cases, is impracticable. The former, however, can be brought about in several ways.

J. F. Barkley of the Bureau of Mines in Information Circular No. I. C. 7211 published in May, 1942, makes eight points as follows:

1—"The storing of coal under water." This for the most part, I would say, is undesirable. The cost of preparing for under water storage in most cases is high. The coal, as reclaimed, is very wet and detrimental to plant operation. The increased moisture must be evaporated in the furnace, thus reducing evaporation and in pulverized fuel plants, the capacity of the mills is definitely reduced as the percentage of moisture in fuel increases. In northern United States and Canada, where subzero temperatures are experienced, it is definitely impracticable.

2—"Compressing the pile in layers as with a road roller or tractor to prevent access of air."

3—"Storing large-size coal." To bear out points previously noted, Mr. Barkley states that "coals that give trouble when stored outdoors in ordinary piles in the slack sizes, frequently give no trouble if the fines, say below 10 mesh, or even smaller, are removed before storage." As pointed out above, however the screening of coal before storage would undoubtedly prove very bothersome to the large consumer of coal.

4—"Preventing any segregation of sizes in the pile." This can best be accomplished by piling in layers.

5—"Storing in small piles and keeping the storage height as low as possible." Mr. Barkley goes on to point out that six feet is considered high. Of course this is a definite hardship for most of us and would require untold acres to provide sufficient storage space upon which to store our requirements.

6—"Keep storage away from any external sources of heat." Stored coal, for example, should not be close to hot steam pipes.

7—"Avoid any draft of air through the coal." This has been dealt with above in a general way.

(a) "Sealing the sides and top of the pile to prevent or greatly reduce air circulation through it."

(b) "Providing an airtight coating by a continuous layer of fine coal, approaching pulverized coal in fineness is a practical and effective means of sealing a coal pile. A second covering of lump coal prevents wind and rain erosion of the fine coal layer."

(c) Store coals where possible in protected locations where they are not subjected to strong and constant winds. Mr. Barkley points out that "winds are probably more responsible for air movement and heating in coal piles than is the stack effect within the pile."

(d) "An airtight coating of asphalt actually extinguished combustion in a large pile and changed rapid heating into slow but positive cooling."

Sealing Piles

I understand that sealing of piles with asphalt or bituminous coating has been practiced for some time in the midwest and western points of the country.

At the present time one of the large and outstanding companies here in the east is experimenting with bituminous applications to coal piles and I understand has met with a great deal of success. It is my understanding that in the near future this company will probably be in a position to spray your pile on a contract basis for something less than $0.10 per ton of coal and that the method used will be in the neighborhood of 90 to 95% effective not only as an elimination of spontaneous combustion but also as a seal to prevent moisture from gaining access to the pile.

8—"Using older portions of the storage first, avoiding accumulations of old coal in corners."

Temperature pipes driven into the pile are effective in checking temperature in the pile. In one case, where a large storage pile existed, we drove 1¼ inch pipes at about 25-foot intervals throughout the pile. These pipes were sealed at the lower ends. Maximum reading thermometers were dropped into the pipes suspended on sash chains and temperatures observed about once each week. A noted temperature of 120 to 130° F. was the warning signal. If the temperature at this point continued to increase the pile was "dug out" at that point.

Notice I did not say that an attempt was made to eliminate the "hot spot," with water. In a great many cases water just adds to the trouble.

A great deal has been written on the storing of various coals based on physical and chemical characteristics and a great deal of the data has also been disputed. A few years ago the general belief seemed to be that a high-sulphur coal would not store and that most coal pile fires were due to sulphur. This has been a much disputed subject and the bearing of sulphur content of the coal to be stored is undoubtedly dwarfed by other more important factors in the light of present day knowledge and experience.

We do not wish to advocate the storage of exceptionally high-sulphur coals except where absolutely necessary. However, of more importance, we believe, are such items as:

1. Segregation of sizes in the pile
2. Degradation due to dropping coal onto pile from a great height
3. Condition of storage ground from standpoint of drainage, etc.
4. Protection of pile from strong winds
5. Control of ventilation of pile by capping in one of the above mentioned methods
6. The observation of temperatures in the pile.

3—Making the Most of What We Have or Can Obtain

My attention has recently been called to a plant which now has 27 different coals in storage. I doubt if any of us will even approach this condition. It is needless to point out, however, that different coals are apt to have entirely different burning characteristics and with the fuel situation as it is today, we may all be forced to burn coals which we otherwise would not accept.

We must, therefore, adapt ourselves or our plants to the burning of such fuels as we can obtain.

We may be assured that the fuels which we will be able to obtain for the duration will certainly be no better than those obtained previously and in most cases, probably of a lower quality.

If we have plenty of standby capacity, when we reach the limit of burning rate on the equipment ordinarily operated, we will put another boiler on the line and struggle through. But what of the mill which has always operated more or less on the ragged edge as far as steam plant equipment is concerned. And I think I am talking to the majority now. That mill will be forced to reduce its boiler plant load in one of two ways. Either by curtailing operation or conserving steam. I don't have to tell you what your principals will say, regardless of the fuel, if the boiler plant becomes the bottleneck and paper machines are shut down—you know—probably have been through it before for one or another reason.

Well, we are going to get the most out of our burning equipment and we are going to conserve steam in order to keep running. Suitable priorities cannot be obtained for new equipment even if we were disposed to install new equipment. Deliveries would be such as to make impossible installations this year, at any rate.

What are we going to do about it? A paper com-

pany executive remarked to me the other day in discussing Conservation Practice Bulletin issued by A.P.P.A. in cooperation with TAPPI, that a great deal of the data presented was elementary. Possibly he was taking a crack at me for my contribution to Bulletin No. 5—"Conservation of Fuels" in which were asked 9 elementary boiler plant questions.

He has not as yet had an opportunity to review the answers to the fuel questions sent out some time ago. His plants possibly are not operating at 60 to 65% efficiency—plenty of the others are, however, as evidenced by some of the data submitted.

I am telling you that a great many of us are asleep and it is necessary to start with the elementary.

Sometime ago a friend of mine, not by the way in the paper industry—asked me if I would look over his boiler plant to determine the cause of the high coal consumption and inability to carry the plant load. I visited the plant during a Sunday shutdown. He had a battery of H.R.T. boilers. We asked one of the workmen in the boiler house to open the front access doors on one of the boilers so that we might inspect the flues. When the doors were opened, we were nearly smothered with probably a half truck load of soot. Obviously those doors had not been opened or the flues blown for weeks. Does this condition also exist in some of our 60% plants?

Elements of Combustion

I cannot emphasize too strongly at this time your attention to the elements of combustion.

1—Your attention to the physical conditions of your burning equipment, your stokers, your pulverizers.

2—If you have insufficient draft gages, have your laboratory make them with material available in every plant and require your firemen to fire by them.

3—Determine the proper CO_2 and insist that you get it. If you have no Orsat apparatus, make or buy one and insist that it be used.

4—Insist that your boilers be kept clean, free of both soot and scale.

5—Make sure that your settings are tight, free of air leaks. One of our plants increased its efficiency 2½ points recently by repairing settings and eliminating leaks.

6—Check the pipe covering.

7—Make sure that all returns are getting back to the feedwater heater.

8—Check your blow downs.

9—Check the combustible in the ash

10—Check pulverization

Conclusion

Most of these are the same points on boiler operation cited a year ago. They are elementary but still the basis for efficient boiler-plant operation, and they are extremely inportant in the light of data submitted in the TAPPI survey of fuels.

So much for the steam-generating plant. The average paper mill as a general rule is wasteful of steam, air, water as you all very wel know. Valves are opened by the machine help and left open. The commodity behind that valve "costs" nothing because the operator only has to open the valve to get it. He personally pays nothing for it except the energy to open the valve and in most cases, he hasn't the energy or time to close it.

If you are generating your own power by steam, that open valve definitely adds to your steam-plant load. If you are purchasing the power, it adds to the load of the utility which may reflect back to your own coal pile indirectly. Wastes of this kind must be eliminated.

All outside doors should be vestibuled, especially those doors to your loading platforms. They may be an inconvenience, but are absolutely essential in this fuel conservation program.

Overheated rooms are often cooled by opening windows, but during this cooling process the heat is seldom shut off. Insist that this practice be stopped.

One of the big heating losses in a paper mill is in the machine room through the exhaust stacks above the machines. The chances are that if relative humidities are obtained by psychrometer in the exhaust stacks, you will find the humidities extremely low, indicating that a great deal more air is being removed from the machine room than is necessary to convey the moisture from the machine. This means waste heat. Damper the exhaust stacks and regulate the dampers to give you maximum economy. And by all means, close the dampers when the mill is not operating.

A test was made in one mill a few years ago after the installation of exhaust stack dampers and that mill saved over $12,000 during one heating season.

Steam or heating inspectors working in cooperation with engineers, department superintendents, and foremen usually return big dividends. It might be wise to employ or designate such men in your organization during this crisis.

Most paper mills are located in more or less isolated places and do not have close neighbors. However, in some instances, plants are located in such a way as to be able to cooperate very nicely with plants in close proximity to their own in the conservation of fuels.

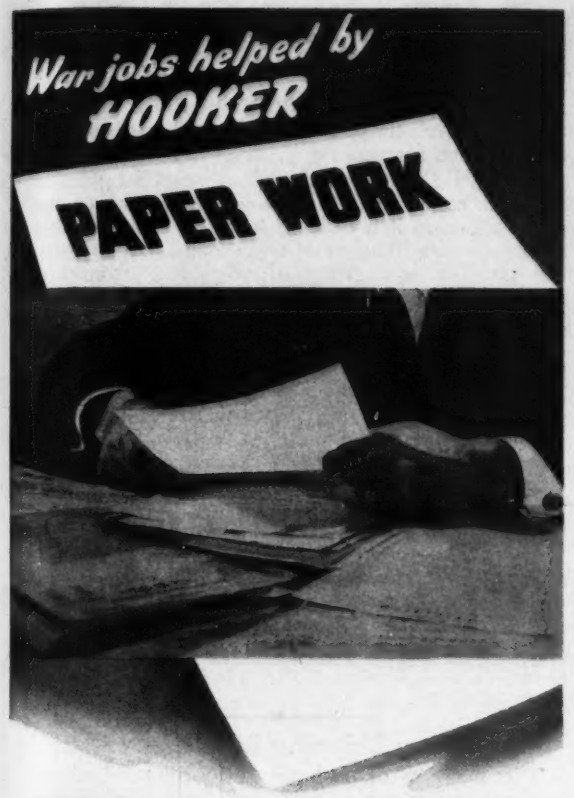
One of our plants is next door neighbor to a converting plant, which a few years ago had a very high-cost oil-fired heating plant. This company approached me to advise what steps could be taken to cuts its heating cost. The result was that we entered into an agreement with them to sell them steam if they would install the pipe line. The result—a saving of about $0.25 per 1000 pounds of steam to them. Cooperative measures of this kind are definitely essential today and should be investigated by each and every one of us.

The above points dealing with plant economy in the use of steam, air and water are, of course, not intended by any stretch of the imagination to cover the field. They are merely cited as examples of what can and should be done, as a means toward eliminating or at least helping to eliminate bottlenecks.

This is a total war and power plant engineering and good housekeeping are just as essential to the war effort as any of the rest of the conservation program. Let's wake up! Let's put our own house in order for the good of the industry and the nation.

Acknowledgments

1. Acknowledgment of cooperation of J. Floyd Massey and associates, of J. F. Massey Company, Fuel Engineers of New York, in assisting in preparing data on fuel transportation.
2. Acknowledgment of cooperation of R. R. Sayers, Director United States Bureau of Mines, Washington, D. C.
3. Bureau of Mines Information Circular I. C. 7074, "Spontaneous Combustion of Coal," May, 1939, by O. P. Hood.
4. Bureau of Mines Information Circular I. C. 7211, "Pointers on the Storage of Coal," May, 1942 by J. F. Barkley.
5. Acknowledgment of cooperation of Bituminous Coal Division of U. S. Department of Interior for coal production and consumption figures used.
6. Acknowledgment of coperation of Encyclopaedia Brittannica Research Bureau.



INDUSTRY is flooded with torrents of paper work — jobs without which our war economy could not operate. This paper tonnage is piled on top of that for print, containers, wrappings, blue prints and almost countless other paper products —and warnings of greater loads are heard. All of which suggests the importance of

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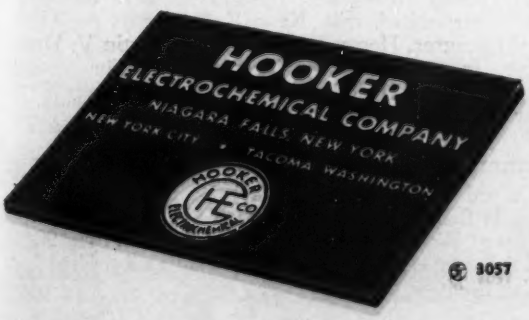

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WEEK ENDING NOVEMBER 21, 1942

SUMMARY

Newsprint .....337 rolls
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NEWSPRINT

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E. Dietzgen & Co., ——, ——, 19 cs.

GLUE STOCK

——, ——, ——, 121 bls.

Tension Factor in Life of Belting

Conclusive evidence that the life of transmission belting and V-belts is greatly influenced by the tension factor, and that an increase in the tension over that recommended for the belt operation will result in failure of the belt long before it should break down is furnished by data from a series of tests conducted under the supervision of George H. Stewart, belting engineer of The B. F. Goodrich Company.

Results of the tests are released by the company as another contribution to the country's rubber conservation program.

Three grades of the present war-time construction of transmission belting were used in that series of tests, which were run at 15 pounds per inch per ply, a 720 pound total for the tension, the recommended figure, and at 18 pounds per inch per ply, a total of 864 pounds tension, on 4 inch pulleys. Belts were all 6 inches wide, 30 feet in length, spliced in 10 foot endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hours before breakdown while under the 18 pound tension, and increased its life to 230 hours before failure when the 15 pound tension was used.

Belt No. 2 ran for 88 hours at the 18 pound tension, and for 263 hours before failure at 15 pounds.

Belt No. 3 ran for 15 hours under 18 pound tension, and the service life before failure jumped to 48 hours under the 15 pound tension.

Conclusions reached, Engineer Stewart's report says, are that an increase of three pounds per inch per ply over the recommended tension results in the belt giving only approximately one-third of its useful service life.

Similar conclusions were drawn from tests conducted on one style of V-belts, used on a popular make washer. The accelerated test consisted of a dead load suspension with the driver sheave 2⅝ outside diameter by ½ inch top by 36 degrees and the driven sheave of 5¼ inch outside diameter by ½ inch top by 40 degrees.

First three belts under tension of 125 pounds center to center, averaged 4½ hours of life before failure.

Second three, under 95 pound tension centers averaged 27.4 hours, while the last three, under 80 pounds, averaged 86 hours.

In giving these test results, The B. F. Goodrich Company points out that because of their short, highly accelerated nature, they are not an index to life in actual service, and were made only to get data on the ratio of tension to belt life. To have any direct evaluation to real service, tests should be made for much longer periods, the report discloses.

Powell River Men Meet in England

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., November 16, 1942.—From London, England, comes a report of a reunion of all former employees of the Powell River Company now on active service in England with various units of the armed forces.

In all 71 Powell River men attended the reunion which is stated to be unique in the history of the present war, as it is believed to be the first time that an organization reunion of any group from any special area or any group of employees from any special Company held a reunion when on active service in Great Britain.

The idea of a Powell River overseas reunion was originated by Corporal Schon, now with the R.C.A.F. He contacted Canadian officials in London, interviewed the staff at the Canadian Beaver Club and arranged for special entertainment. The Powell River Company sent Air Mail letters to commanding officers of overseas units asking for their co-operation in arranging leave for the Powell River boys of their units. In each case this co-operation was unreservedly given. The Powell River Company also assumed the responsibility of contacting every individual Powell River man known to be in England, and of the total enrollment of former employees in Great Britain only a very small number were unable to attend. In practically every case these sent a letter expressing their regrets.

Forms New Shipping Sack Committee

The Division of Industry Advisory Committees of the War Production Board, announced on November 21 the formation of a new industry advisory committee covering multi-wall paper shipping sacks.

John E. Zeller, of the Containers Branch, is the Government Presiding Officer. The committee members are as follows:

F. G. Bemis, president, Bemis Brothers Bag Company, 40 Central street, Boston, Mass.; George Brown, vice-president, Raymond Bag Company, Middletown, Ohio; J. L. Madden, assistant treasurer, Hollingsworth & Whitney Company, 60 Batterymarch street, Boston, Mass.; A. A. Scholl, president, Bagpak, Inc., 220 East 42nd street, New York; Willard J. Dixon, vice-president, St. Regis Paper Company, 230 Park avenue, New York; F. H. Ludington, president, Chase Bag Company, 155 East 44th street, New York; and M. J. Davis, president, Hammond Bag and Paper Company, Wellsburg, W. Va.

K. E. Tozier Co. Incorporates

BOSTON, Mass., November 16, 1942.—The K. E. Tozier Company, paper and paper products, 122 Pearl street, in business for some time in this city, has incorporated, with Keno E. Tozier as president and treasurer. Henry L. Yocum and Martin V. Dunning, Jr., are the other incorporators. The capital stock consists of 500 shares of common stock of no par value.

American Wringer Flies Minute Man Flag

Word has just been received that the Minute Man flag is flying over the American Wringer Company plant at Woonsocket, R. I., signifying that over 90% of the employees of that company have subscribed for War Savings Bonds.

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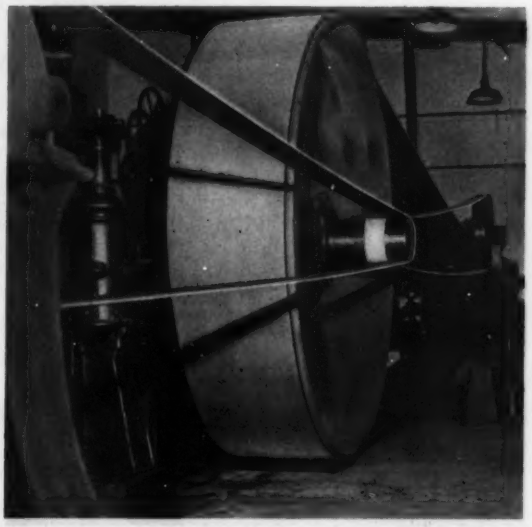

TANNATE flat leather belts keep machines running at peak efficiency, without trouble, with very little maintenance. They carry practically full load, even when damp . . . are cemented with waterproof cement and treated to resist moisture.

Says one user: "Our Tannate belts have needed shortening only once in 16 years . . . operating in dampness and temperatures up to 105° the year around." Crediting a Tannate belt on a wood chipper, another user reports 1/3 increase in output, longer life, and substantially lower chipping cost!

Take the hint! . . . For increased output and reduced cost, *try Tannate!*

J. E. RHOADS & SONS
Established 1702
35 North Sixth Street, Philadelphia, Pa.
NEW YORK • CHICAGO • ATLANTA • CLEVELAND

STEP UP PRODUCTION with
RHOADS *Tannate*
WATERSHED
LEATHER BELTING

New York Paper and Pulp Market Review

Good Demand Is Widely Reported For Many Grades of Paper—Pulp Market Little Changed—OPA Issues Improved Definitions For Waste Paper and Adds Two New Grades and Other Changes

Office of the PAPER TRADE JOURNAL.
Wednesday, November 25, 1942.

Continued activity at a relatively high level is reported in the wholesale paper market at this date. Most of the current reports received from many manufacturers' representatives, jobbers, and general paper merchants, reflect grave concern for the future. It is gratifying to note the widely expressed desire of so large a proportion of the trade to cooperate so far as possible with government agencies to further the progress of the war effort.

The index of general business activity for the week ended November 14, rose to 135.7%, from 131.2% for the preceding week, compared with 132.2% for the corresponding week last year. Paper board production was 2.5% higher.

Paper production for the wek ended November 14 was estimated at 89.6%, compared with 107.0% for 1941, with 87.4% for 1940, with 98.4% for 1939, and with 81.6% for the correspond week for 1938.

Paper board production for the week ended November 14 was 83.0%, compared with 99.0% for 1941, with 77.0% for 1940, with 83.0% for 1939, and with 67.0% for the corresponding week for 1938.

The all-over sales volume in the New York market is good, and is attributed in part to anxiety to provide adequate inventories, when, and if, a substantial curtailment of paper for civilian requirements is directed by the WPB. Some reports indicate that the trend of purchasing by many consumers at retail, is more definitely downward. The paper shortage publicity talk has, reports indicate, been capitalized upon by many retail merchants to reduce the costs of wrapping paper and bags. The questionable sanitary practice of re-using bags for food stuffs, has repeatedly occurred. This factor, and the rather wide adoption of retail buyers in supplying their own shopping bags, has decreased consumption of kraft wrapping paper. Sulphite wrapping paper has also decreased through the same cause, as housewives are cooperating with the government to "save paper and win the war."

The OPA, on November 21, issued amendments, reducing manufacturers' and distributors' mark-ups to those prevailing early in 1941. The reductions reflect an OPA rollback in July of $5 per ton in the price of kraft bag papers, the basic material in grocers' and variety bags.

The new prices are set in Amendment No. 3 to Maximum Price Regulation No. 182 Kraft Wrapping and Bag Papers. By Amendment No. 11 to Maximum Price Regulation No. 129. The OPA removed standard grocer's from Regulation No. 129, which had previously controlled these items. The amendments are effective November 27, 1942.

Wood Pulp

A further curtailment in the manufacture of paper-making grades of chemical wood pulp, is expected to be announced next month. This reduction is also expected to be quite drastic in its effect upon the manufacture of paper.

Rags

Mill buying of new cotton cuttings is reported fair this week. In the old rag market, roofing rags are quite active, with mills paying ceiling prices. Demand for old whites and blues is light at this date, with prices soft.

Old Rope and Bagging

Steady demand for old No. 1 Manila rope continues to absorb about all available supplies, at the ceiling price of $115 per ton. Good current demand is also reported on strings.

Demand for scrap bagging is slow. Prices, of all but the roofing grades, are nominal at this date.

Old Waste Paper

Better prices are currently reported paid for white news cuttings, ledgers, and on No. 1 heavy book stock. The lower grades are unchanged.

The OPA on November 21, issued improved definitions on waste paper contained in Maximum Price Regulation No. 30. This regulation supercedes Revised Price Schedule No. 30. The change is effective November 27, 1942. New grades added are, "Old Kraft Corrugated Containers," and "Mill Wrappers."

Twine

No important change in demand or prices has been reported in the twine market this week. Demand continues heavy for some grades of cordage. Demand for twine is good for the season on most grades of hard and soft fiber twines.

Paper Merchants Plan Convention

The National Paper Trade Association is approaching a milestone in its history, its 40th annual convention. A. H. Chamberlain, its executive secretary, announces:—"To relieve any doubts due to the cancellation of our fall meeting at the behest of the Office of Defense Transportation, we can definitely announce that the Annual Convention will be held as usual, February 15-18, with headquarters at the Waldorf-Astoria, New York City.

"The Office of Defense Transportation has modified its attitude through official statements to the effect that conventions are not discouraged if they will provide an opportunity for disseminating needed information to industry and ten "to education business and professional men to the war program." This will certainly be the primary objective of our meeting and members may be sure that their attendance will be justified.

"We shall also hold the Room Exhibit of Wrapping Papers, Paper Products, Twines and kindred lines which has become a permanent feature of our Conventions. It is believed that under present conditions manufacturers will welcome this opportunity to show their products and meet their customers at a minimum of travel and expense."

UNITED PIGMENTS

Pure Titanium Dioxide

UNITANE-O

A brilliantly WHITE, pure, fine titanium dioxide possessing excellent . . .

- **OPACITY**
- **BRIGHTNESS**
- **DISPERSION**

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces whiter sheets of great brilliance, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request

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UNITED COLOR AND PIGMENT CO.

DIVISION OF INTERCHEMICAL CORPORATION

NEWARK, NEW JERSEY

SALES OFFICES IN PRINCIPAL CITIES

WOOD ROOM PAPER MILL **EQUIPMENT**

Barking Drums
Send for complete information on Murray equipment.
Other models available with vertical cutting heads.
Wood Cleaners
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Roll Heading Machines
GRID Unit Heater—now made with Cast Iron heating sections.
Cast Iron replaces aluminum in the GRID Unit Heater, to cooperate with the war effort—no electrolysis—made for years of dependable service. Ideal for paper mill heating requirements.

D. J. MURRAY MFG. CO.

WAUSAU, WISCONSIN

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, November 25, 1942.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton, f.o.b., works. Demand reported good for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported heavy for the week. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 19 cents per pound; 80-100 mesh, at 19½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, at 7½ cents per pound, c.i.f., is nominal. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda continue unchanged at prevailing market prices. Demand reported fair. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.75 per 100 pounds in drums, car lots, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filter clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market strong. Government demand is reported heavy during the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with lower prices on some grades. "G" gum rosin is currently quoted at $3.46 per 100 pounds, in barrels. Savannah "F" wood rosin is currently quoted at $3.45 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $3.66 per 100 pounds f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand fair for the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome salt cake at $16 per ton. Restrictions on chrome cake removed. All prices in car lots, f.o.b., shipping point. The quotation of $16 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, carlots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported light for the current week. The commercial grades are currently quoted at from $1.15 to $1.25; iron free at from $1.75 to $1.85 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $15 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	$5.00	@	—
No. 1 Wrapping	4.75	"	—
Standard Wrapping	4.50	"	—
Standard Bag	4.125	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. f. s.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	5.30	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Est. No. 1	$40.25@$47.25		$41.40@$48.50
100% Rag	32.20 " 37.75		33.35 " 39.25
85% Rag	.... "		32.20 " 37.75
75% Rag	24.75 " 29.00		25.90 " 30.50
65% Rag	.... "		22.80 " 27.75
50% Rag	18.70 " 22.75		19.90 " 24.25
25% Rag	16.40 " 20.00		17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1	$10.55@$12.75		$11.70@$14.25
No. 2	9.65 " 11.75		10.80 " 13.25
No. 3	9.20 " 11.25		10.35 " 12.50
No. 4	8.90 " 10.75		10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite			$76.00
Unbl. Softwood Sulphite	64.00	@	66.00
Bl. Hardwood Sulphite			73.50
Unbl. Hardwood Sulphite			63.50
Bl. Mitscherlich			81.00
Unbl. Mitscherlich			72.00
N. Bleached Sulphate			86.00
S. Bleached Sulphate			79.00
N. Semi-Bleached Sulphate			82.00
S. Semi-Bleached Sulphate			75.00
N. Unbl. Sulphate			73.00
S. Unbl. Sulphate			63.50
Bl. Soda			66.00
Unbl. Soda			62.00
Groundwood			46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	13.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)			
Shirt Cuttings—			
New White, No. 1.	8.00	@	8.25
Silesias No. 1	4.50	"	4.75
New Unbleached	8.00	"	8.25
Blue Overall	5.75	"	6.00
Fancy	3.00	"	3.25
Washabies	2.50	"	2.75
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

"NON-USERS ARE THE LOSERS"

TENAX FELTS

PROFIT PRODUCERS

EQUIPMENT TIME

The 1941 backlog of paper and board has been used. Already there are signs of renewed demands during 1943 . . . Now is your golden opportunity to renew worn TENAX FELTS. Men and materials will become difficult to get and keep. TENAX FELTS work hard for long hours extending over the months and years.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

Newfane, N. Y. — U.S.A.

Which One Is Best For You

A SHEAR CUT OR A SCORE CUT SLITTER?

Let Cameron answer that problem for you. Because we make both shear cut and score cut slitting machines. Cameron engineers can help you to make an unbiased selection. At the same time we can recommend the correct winding method for your job. Write for interesting literature.

CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, New York

Old Rags

White, No. 1—			
Repacked	*3.80	"	
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35		
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Mixed Books	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	1.75	"	—
Old Corrugated Containers	1.00	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16		
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¾
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¾
No. 2 Mixed	.02¾	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.90	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	70	"	—
Box Board Cuttings	72½	"	—
Jute Corrugated Cuttings	90	"	—
Overissue News	.85	"	—
No. 1 News	1.00		

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.50	@	4.00
Sisal Rope	4.50	"	4.75
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.75	"	5.25
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.50	"	3.75
Scrap Sisal	4.50	"	4.75
Scrap Sisal for Shredding	—	"	.04¾
Wool Tares—			
Foreign	(nominal)		
Domestic	5.00	"	5.75
Aust. Wool Pouches	5.10	"	5.25
New Burlap Cuttings	5.00	"	5.25
Heavy Baling Bagging	4.25	"	4.75
Paper Mill Bagging	2.75	"	3.00
No. 2 Bagging	1.35	"	

* OPA Maximum Price

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.06¼	"	.06½
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06	"	.06½
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05¼	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.25	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
* Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—